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I, Hyejin Kim, hereby submit this original work as part of the requirements for the degree of Doctor of Philosophy in Criminal Justice.

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**A Multi-Level Analysis of the Effects of Treatment Integrity and Program Completion on Recidivism in Residential Community Correctional Programs**

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**A Multi-Level Analysis of the Effects of  
Treatment Integrity and Program Completion on  
Recidivism in Residential Community Correctional Programs**

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## Abstract

To date, a large body of research has demonstrated empirical support for rehabilitative correctional interventions. Specifically, the literature has verified that correctional treatment services that embody the principles of effective correctional interventions and have sophisticated implementation plans tended to be more effective than others in reducing recidivism. It has also been found that those who complete treatment programs are less likely to recidivate relative to those who do not, because they benefit fully from the intervention. The question is, does the effect size of treatment completion vary depending on the level of therapeutic integrity?

In order to examine the possible interaction between program completion and integrity (i.e., whether the effect of program completion was moderated by treatment integrity), a multilevel analysis was conducted with a sample of 10,072 offenders who were assigned to one of 64 residential, community-based correctional interventions in Ohio between 2006 and 2007. Recidivism was defined as a re-conviction for a new felony offense and two years of follow-up were employed. Collection of the recidivism data began in April 2009 and ended in September 2009.

The results of hierarchical linear modeling analysis indicated three major findings. First, program completion by itself did guarantee success for adult offenders. Second, program integrity does matter. Among five program characteristics that were found to be related to recidivism in prior research, only *treatment characteristics* were linked directly to reductions in recidivism. Third, no significant interaction was found between program completion and treatment integrity; treatment integrity did not moderate (enhance or reduce) the effect of program completion on the probability of being convicted for a new felony crime.

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## Table of Contents

CHAPTER ONE .....	1
Introduction .....	1
Residential Community Correctional Facilities .....	3
Research on Community-Based Correctional Intervention .....	4
Conclusions .....	5
CHAPTER TWO .....	7
Introduction .....	7
Origins of Reformatory Corrections .....	7
The “Nothing Works” Movement .....	9
Dispute Over the “Nothing Works” Doctrine .....	10
Principles of Effective Intervention .....	11
Risk Principle .....	14
Summary of the Risk Principle .....	19
Need Principle .....	19
Summary of the Need Principle .....	26
Responsivity Principle .....	26
Summary of the Responsivity Principle .....	29
Treatment Integrity and Program Effectiveness .....	30
Summary of Treatment Integrity and Program Effectiveness .....	36
Treatment Integrity and Program Completion .....	36
Summary of Treatment Attrition and Program Effectiveness .....	38
Conclusions .....	39
CHAPTER THREE .....	40
Introduction .....	40
Research Questions .....	40
Program Participants .....	41
Individual Level Data Collection .....	42
Program-Level Data Collection .....	42
Program-Level Data Description .....	44
Program-Level Data Descriptions .....	45
Program Integrity (CPC) .....	45

Program Setting (CBCFs versus HWHs) .....	47
Multilevel Analysis .....	48
Conclusions .....	50
CHAPTER FOUR.....	52
Introduction .....	52
Descriptive Analyses.....	52
Inferential Analyses with Hierarchal Linear Modeling.....	55
Unconditional Random Intercept Model and ICC.....	55
Random Intercept Model with Macro Explanatory Variables.....	56
Random Intercept Model with Micro Explanatory Variables .....	58
Cross-Level Interaction Model.....	60
Additional Multilevel Logistic Regression Analysis by Program Setting .....	64
Conclusions .....	68
CHAPTER FIVE .....	69
Introduction .....	69
Summary of Findings .....	70
Limitations .....	72
Implications.....	75
Policy Implications.....	75
Implications for Future Research .....	78
REFERENCES .....	81
Appendix A: CPC Items for Five Sub-Categories.....	93

## **List of Tables**

Table 1. The Central Eight .....	22
Table 2. The Central Eight (Continued).....	23
Table 3. The Central Eight (Continued).....	24
Table 4. Individual-Level Variables and Coding Scheme .....	44
Table 5. Program-Level Variables and Coding Scheme .....	48
Table 6. Descriptive Statistics for Individual Characteristics .....	53
Table 7. Descriptive Statistics for Program Characteristics.....	54
Table 8. Summary of Multilevel Regressions of Variables on Recidivism (Re-conviction). ..	62
Table 9. Summary of Multilevel Regressions with CPC Sub-Categories .....	63
Table 10. Multilevel Logistic Regression Analysis with HWH Cases .....	66
Table 11. Multilevel Logistic Regression Analysis with CBCF Cases .....	67



## **CHAPTER ONE**

### **Introduction**

For the past thirty years, the U.S. has housed an ever-increasing number of prison inmates. Indeed, between 1980 and 2014, the U.S. correctional population grew from 300,000 to 2.3 million. This figure places the U.S. eight times ahead of its Western European counterparts in rates of confinement (Carson, 2013). This incredible increase in incarceration has overcrowded prisons and put much pressure on state governments that have already been overwhelmed by the burden of funding an expanding penal system.

To ease that burden, state and local policymakers have expanded community-based correctional interventions during the last two decades. The growing use of community-based programs, coupled with a raise in early release from prison, increased the population of offenders under community supervision greatly<sup>1</sup>. However, this increase in community supervision has not resulted in a concomitant decrease in incarceration. Despite reformers' expectations that active use of noncustodial sanctions would relieve America's disproportionately high rate of incarceration, relevant research has suggested that the nature of the relationship between incarceration and community supervision is rather complicated (Cullen & Jonson, 2012).

According to official statistics, one-half of jailed offenders and over one-third of imprisoned criminals are incarcerated because their community supervision was revoked for non-compliance with technical requirements (Burke et al., 2007). A more recent study that examined recidivism patterns of prisoners released in 30 states from 2005 and 2010 proposed that 47.9% had either a parole or probation violation or a new arrest within 3 years that led to

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<sup>1</sup> The number of persons on probation more than quadrupled during the latter half of the 20<sup>th</sup> century, from over 800,000 to 4,000,000. In addition, the number of individuals serving terms of supervision following imprisonment skyrocketed from 170,000 to more than 8,500,000.

imprisonment, and over 55% had a parole or probation violation or new arrest that led to imprisonment within 5 years (Matthew, Alexia, & Howard, 2014). These statistics suggest that current community-based supervision merely defers, rather than replaces, incarceration (Petersilia & Turner, 1993).

In response to the criticism that existing community correctional interventions simply delay incarceration, lawmakers and scholars have begun recently to develop treatment interventions that primarily focus on rehabilitation (Cullen & Jonson, 2012). In particular, the emergence of principles of effective correctional interventions has changed the correctional response to criminals in the U.S. significantly. Based on accumulated research findings, the theory of effective correctional practice suggest that treatment interventions that follow the principles of Risk, Need and Responsivity (RNR) can produce more positive outcomes relative to programs that do not (Andrews & Bonta, 2010; Lowenkamp, Flores, Holsinger, Makarios, & Latessa, 2010).

In addition, the literature has shown that favorable effects of correctional intervention can be amplified by taking treatment integrity into account (Lowenkamp & Latessa, 2005). Program integrity reflects “the extent to which services that are provided in practice compare to the originally specified theory and design” (Lowenkamp et al., 2010, p. 370). For example, if the program targets non-crime producing factors, or if staff are not trained properly, the integrity of what might have been a good plan is shattered, and generates undesirable outcomes. In numerous studies, program integrity has been found to have a considerable effect on reducing recidivism (Latessa, Lovins, & Smith, 2010; Lowenkamp & Latessa, 2005; Lowenkamp et al., 2010; Lovins, 2012).

Although the significance of program integrity appears intuitive, research that examines its comprehensive role in shaping treatment outcomes has remained underdeveloped to date, and only a few studies have examined how the diverse levels of

treatment integrity influence program effectiveness differently due to complexity in statistical modeling (Lowenkamp & Latessa, 2005). More importantly, even fewer studies have examined whether there is a possible interaction between program completion and treatment integrity. Although some research has tested this association, the analysis of both quantitative (Strauss & Gregory, 2000) and qualitative (Feldman&Wodarski, 1983) data have suffered because treatment integrity has not been evaluated with a validated assessment tool.

Therefore, this dissertation was designed to add to the growing body of research that identifies the ideal treatment conditions necessary to maximize the effectiveness of residential correctional programs in community settings. Three research questions were addressed. First, does the completion of residential programs have a significant effect on recidivism? Second, is program integrity associated significantly with recidivism? Lastly, and most importantly, does the effect that program completion has on recidivism differ according to the degree of program integrity?

### **Residential Community Correctional Facilities**

Residential, community-based correctional facilities are designed for offenders who require a more structured environment than do those who are able to live independently. For example, halfway houses are the most common form of community-based community facilities operated in the U.S. In preparation for reentry to the community, offenders are placed in halfway houses to serve either all or part of their sentences, or to live for a period of time after being released from a federal correctional institution. In fact, the term “halfway house” illustrates the unique legal status of the offenders that they admit: those who are halfway out of and into prison (Latessa & Smith, 2011).

The concept of community-based intervention originated in the U.S. during the early 1800s. At that time, “solitude” was practiced at most correctional institutions as a primary treatment method. Pursuant to that model, inmates were confined to their cells and prohibited

from interacting with others in order to avoid “contamination” that could disturb efforts at reformation (Cullen & Jonson, 2012). However, due to the prison riots that occurred frequently under such a strict management system, states began to support an alternative that encouraged building temporary shelters to help inmates as they transitioned back into the community. Since the Issac T. Hopper Home opened in 1845—one of the first halfway houses—the number of offenders residing in community correctional facilities increased rapidly. Currently, almost 10% of the total inmate population in the U.S. resides in community-based correctional facilities (Maruschak & Bonczar, 2013).

Many community-based facilities supply offenders with diverse treatment services that range from simple in-house programs to intensive outpatient treatment, and most have their own distinctive ways of operating in terms of the composition of clients they serve and the types of treatment programs they offer. However, most share the common value that offenders should be allowed to live in a comfortable and realistic environment; thus, pro-social skills developed in these treatment programs can be absorbed more effectively and sustained for a longer duration (Dowell, Klein, & Krichmar, 1985; Latessa & Travis, 1992).

### **Research on Community-Based Correctional Intervention**

Empirical research designed to document the effectiveness of community-based treatment programs has revealed that such interventions are oftentimes more effective in decreasing reoffending than are traditional parole methods (Latessa & Allen, 1982) and incarceration (Gendreau, French, & Taylor, 2002; Lipsey & Wilson, 1998). Researchers have explained that community-based correctional interventions enhance offenders’ ability to refrain from criminal activities significantly by minimizing exposure to inhumane prison environments, and by providing secure settings that facilitate the acquisition of stable employment and housing (Latessa & Travis, 1992; Toch, Adams, & Grant, 1989).

However, not every study (e.g., Latessa, Lowenkamp, & Bechtel, 2009; Seiter et al.,

1977) has provided support for the effectiveness and continued use of community-based residential interventions; after reviewing 35 halfway house evaluations, Seiter and colleagues concluded that there was "...little evidence available to conclude that halfway houses are assisting in the reintegration of ex-offenders by increasing their ability to function in a socially acceptable manner" (p. 26).

Latessa (1998) explained that, although residential community correctional facilities had the potential to have a sizeable positive influence on reducing an offender's criminal propensities, limitations in program integrity—e.g., lack of assessment, under-qualified program administrators, high turnover among program staff, and an absence of theoretically-based treatment plans—may influence effectiveness and sometimes even generate undesirable outcomes. Later, Latessa and colleagues added that interpreting the influence of community-based interventions required caution, as a causal link between program involvement and recidivism was moderated occasionally by various factors, including the risk level of offenders and the status of program completion (Latessa, Lovins, & Smith, 2010).

### **Conclusions**

In general, few correctional researchers have attempted to explain the interaction between treatment program attrition and integrity. Hence, the goal of this dissertation was to address that deficiency. The outcome of this research is expected to have theoretical implications for understanding recidivism by testing the validity of the theory of effective correctional interventions. The results of this research will also contribute to the practical implications of treating offenders by identifying ideal treatment conditions that maximize the effectiveness of community-based residential programs for adult offenders.

The study analyzed a sample of 10,072 offenders who were assigned to one of 64 Ohio residential correctional facilities between February 1, 2006 and June 1, 2007 to examine: 1) the effect of treatment attrition on continued criminal behavior; 2) the effect of

program integrity on recidivism; and 3) how program completion and program integrity interact to influence the odds of subsequent criminal behavior.

## **CHAPTER TWO**

### **Introduction**

This chapter discusses how correctional rehabilitation efforts have progressed since the late 19<sup>th</sup> century. Specifically, section one outlines how rehabilitation became a dominant correctional philosophy in the U.S. The second section describes why the rehabilitation model fell from favor and how Robert Martinson's controversial essay expedited this process in the late 20<sup>th</sup> century. The third section describes how accumulated knowledge has contributed to the development of the "principles of effective correctional intervention." Finally, the empirical status of the theory of effective correctional intervention is explored in the last section.

### **Origins of Reformatory Corrections**

Rehabilitation became a correctional goal in the U.S. during the period following the American Revolution. Beginning in the 19<sup>th</sup> century, communities transformed from small, stable towns to large, dynamic cities. These dramatic social changes altered Americans' conventional views of crime. For example, citizens began to view crime as a consequence of social disorder, rather than as natural depravity (Rothman, 1980). In response to these changed beliefs about the causes of crime, reformers created a new type of punishment designed to help instill morality—the penitentiary. This new institution was used to transform criminals through hard labor, isolation, repentance, and discipline. By the end of the Civil War, however, it was clear that penitentiaries failed to transform offenders morally, largely because of overcrowding and the use of harsh corporal punishment.

Despite the failure of the penitentiary system to create moral transformation, prison administrators and the public maintained the belief that criminals should be reformed rather than punished. Indeed, prison reformers met in Cincinnati in 1870 to reassert the principle that "...[T]he supreme aim of prison discipline is the reformation of criminals, not the

infliction of vindictive suffering.”

To address the criticism that isolation and penitence did not transform or change offenders effectively, a new penology was developed that focused primarily on motivating offenders adequately to reform their behaviors (Feeley & Simon, 1992). Because reformers of this period assumed that offenders would be more inspired to change if their freedom was at stake, convicted criminals began to receive indeterminate sentences, and the length of a convicted offender’s incarceration was determined by whether s/he had reformed sufficiently.

During the 20<sup>th</sup> century, the development of positivist criminology changed the precise means used to rehabilitate criminals. Influenced by such positivism, reformers embraced the idea that crime was caused by various psychological and social factors that worked in a unique fashion for each individual; therefore, it was believed that, in order to decrease continued criminal behavior effectively, correctional interventions must focus on eliminating individual predispositions to engage in criminal behavior. As a result, each offender was assessed on a case-by-case basis, and then was provided with various forms of treatment interventions (e.g., psychological therapy, education, and vocational training) based upon their identified individual needs.

To implement this ideal system appropriately, correctional personnel and judges needed to wield unfettered discretion about offenders’ release dates, opportunities for adequate treatment services, chances of parole, and lengths of supervision. During the progressive era (1900s-1920s), government agents and criminal justice decision makers were trusted to use such broad discretion wisely to diagnose and cure criminals properly; hence, correctional officers began to make critical decisions that would influence the entire lives of convicted offenders significantly. By the mid-1900s, a variety of rehabilitative approaches (e.g., individualized treatment programs, indeterminate sentencing, probation, parole, and the juvenile court) were implemented in America’s criminal justice system (Rothman, 1980).



This progressive version of the rehabilitation model dominated U.S. corrections for the next 50 years.

### **The “Nothing Works” Movement**

In the late 1970s, the rehabilitative approach to corrections suffered a critical setback as a result of Martinson’s review (1974), in which he claimed that, “nothing works” in rehabilitation. Martinson analyzed 231 treatment evaluation studies conducted between 1945 and 1967 and concluded that, with few exceptions, rehabilitative efforts had no significant effect in reducing recidivism. Although a number of studies reviewed revealed positive treatment outcomes, Martinson claimed that rehabilitation programs in use were not effective enough to overcome the tendency for offenders to continue their criminal behaviors. Later studies also reported pessimistic findings that appeared to confirm Martinson’s conclusions (Brody, 1976; Dilulio, 1987; Gottfredson, 1979; Logan, 1972).

In addition to academic world that was convinced by Martinson’s meticulous state-of-the-art review, the appeal of his conclusions was furthered as well by the dynamic change in the social context of the mid-1970s (Cullen & Gilbert, 1982). This was a period of extreme social and political turbulence (i.e., the Civil Right Movements, urban riots, the Watergate scandal, increased crime rates, etc.) that caused people to question the U.S. government’s ability to control social disorder. Diminishing public trust was eroded further when the state used extreme violence during the 1971 Attica prison riots to repress prisoner protests against inhumane prison conditions. Eventually, the public became convinced that the government was incapable of exercising discretion judiciously and therefore, the criminal justice system and associated correctional practices and services were subjected to intense scrutiny.

Criticism of rehabilitation-oriented correctional interventions has come from across the political spectrum. Both liberals and conservatives objected to the progressives’ paradigm of individualized treatment and lobbied for the use of determinate sentencing. The two

parties, however, opposed state officials' discretion for different reasons—conservatives believed that it victimized society, while liberals believed it victimized offenders.

Conservatives insisted that judges and parole boards used discretion in an overly broad and lenient manner by releasing dangerous and predatory offenders to the streets to victimize innocent citizens. Liberals, in contrast, criticized state officials for using discretion unfairly by giving minorities harsher sentences and requiring offenders to comply with cruel institutional rules in order to be released. Nevertheless, both parties agreed that it was appropriate to curtail discretion, abolish parole, and implement determinate sentencing schemes. Discretion, the linchpin of the rehabilitative correctional model, was thus vilified universally. Accordingly, the rehabilitation model was rejected and a more punitive model was ultimately put in place in the late 20<sup>th</sup> century.

### **Dispute Over the “Nothing Works” Doctrine**

Because the individualized treatment model was criticized so roundly, it appeared that the rehabilitative correctional ideal would lose its political appeal permanently. A number of research studies, however, pointed out that it was necessary to reexamine the validity of Martinson's argument. Ted Palmer (1975; 1978; 1992; 1994), for example, published multiple articles that refuted Martinson's report.

According to Martinson's report, no correctional interventions were able to diminish the rate of recidivism consistently, and only a few unusual cases reported successful outcomes, while most did not. Martinson interpreted these outcomes as a complete failure of rehabilitative treatment model. Palmer's re-examination of the very same studies, however, revealed different results (Palmer, 1978). After counting the total number of studies in which indicate that rehabilitative programs had a positive influence on recidivism, Palmer argued that approximately *half* of the treatment programs demonstrated decreases in recidivism. Specifically, a total of 39 studies (48% of the total) that Martinson reviewed appeared to

successfully decrease the recidivism of participants. If nothing worked, how could half of the studies reviewed in Martinson's report have generated positive treatment outcomes? Based on these findings, Palmer claimed that rehabilitation had a significant effect on offender behavior and that the "nothing works" doctrine should be reevaluated empirically.

Later, Thornton (1987) added that the "nothing works" conclusion was unwarranted because of methodological weaknesses and inaccuracies in Martinson's interpretation. Thornton reexamined the studies analyzed in Martinson's paper and found that only 38 out of the 231 studies used an experimental design that contains control groups. In addition, 16 out of 38 studies that used an acceptable methodology (i.e., recidivism was used as an outcome variable) showed that interventions did have positive treatment effects; only one study showed clearly that a program had a significant negative impact on reoffending. Lastly, because the majority of Martinson's studies evaluated psychological therapies (e.g., intensive casework, psychotherapy, and counseling), Thornton contended that, even if Martinson's assessment was correct, he should have concluded that "psychological therapies did not work," in lieu of stating that "nothing works in rehabilitation." Later studies also undermined Martinson's pessimistic conclusion, thus suggesting that it might be too soon to abandon hope for rehabilitation (Palmer 1997; Andrews & Bonta, 2000).

### **Principles of Effective Intervention**

Since the research that countered Martinson's assessment, academics have focused on expanding our knowledge about "what works" in rehabilitation. Two prominent Canadian psychologists, Paul Gendreau and Robert Ross, published a series of narrative reviews that explained why some programs fail and others succeed (Gendreau & Ross, 1979; 1987). In these comprehensive reviews, Gendreau and Ross assessed over 200 rehabilitation programs and found that success and failure in rehabilitation is patterned, not random (Cullen & Johnson, 2012).

Considering the features of treatment interventions that were successful in reducing recidivism, Gendreau and Ross attempted to develop guidelines for effective correctional interventions that would increase the probability that treatment is effective. They first demonstrated that programs with a behavioral focus were particularly effective in altering offenders' behavior, while punishment-oriented programs were not. Gendreau and Ross observed further that effective programs were designed primarily to change certain internal or social aspects of offenders, which later became referred to as criminogenic needs. Gendreau and Ross defined criminogenic needs as factors that have been proven empirically to be associated with the offender's criminality, and that can be changed through correctional interventions. Thus, if correctional services concentrate on predictors that have been demonstrated to cause criminal behaviors, they are more likely to be effective in reducing recidivism.

Gendreau and Ross assumed that because offenders are marked by various individual differences, (i.e., level of risk for reoffending, personality, and educational background), correctional interventions that take such differences into account during the delivery of treatment would increase the overall effectiveness of the programs. For example, to alter their criminal propensities, high-risk offenders tend to require forms of intervention that are more intensive, while offenders with low intellectual ability can benefit more from correctional services in structured learning settings.

Finally, Gendreau and Ross identified the reason why some correctional interventions fail to achieve their goals: lack of therapeutic integrity. For example, if an intervention had no underlying theory or empirical support, if the program focused primarily on factors that are irrelevant to recidivism, or if the treatment service was implemented by untrained staff, the program was more likely to generate undesirable treatment outcomes. Gendreau and Ross claimed that correctional interventions that follow certain guidelines or principles of effective

treatment would reduce recidivism, whereas those that violate such principles would have no significant effect.

In addition to numerous narrative-review studies, meta-analytic research that compiled findings statistically across different research designs, settings, and measurements supported the Canadian researchers' assertion by demonstrating that rehabilitative correctional programs did reduce rates of recidivism significantly, and that some correctional programs worked better than others in altering criminals' behavior (Andrews et al., 1990; Andrews & Dowden, 2005; Lipsey, 1992; Lipsey, 1999; Lipsey & Cullen, 2007; McGuire, 2002; Smith, Gendreau, & Swartz, 2009).

For example, Lipsey and Cullen (2007) summarized over 40 meta-analyses on correctional interventions and found strong support for human services-oriented programs by comparison to sanction-oriented interventions; their extensive review found considerable reductions in recidivism associated with treatment programs (i.e., 2-50% reductions), modest reductions (i.e., 2-8% decreases) for community supervision, and no effect or increased recidivism rates for incarceration (0-14% increases). These authors determined that the influence of rehabilitative correctional programs was generally positive, and led to an average of 10-40% reductions in recidivism.

Another important finding that has been reported consistently in meta-analytic studies is the homogeneity of effect sizes across various treatment types or categories; some interventions had no effect, while other types of interventions worked well, reducing recidivism up to 40% (Andrews & Bonta, 2010; Lipsey, 1992; 1995; 1999; 2009). This observation was critical in the creation of the theory of the principles of effective intervention that explains what distinguishes rehabilitative programs that produce reductions in recidivism that are more meaningful.

The principles of effective correctional intervention serves as a framework that

facilitates the use of evidence-based correctional interventions by presenting three core constructs of effective correctional intervention: the risk, need, and responsivity principles. Specifically, the “risk” principle stresses that the intensity of service must match an offender’s risk level. The “need” principle focuses on the importance of targeting the crime-facilitating factors that result in criminal conduct. Lastly, the “responsivity” principle addresses the benefits of using social learning and cognitive behavioral models, and adjusting the style and model of treatment according to the relevant traits possessed by individual offenders (e.g., motivation, intellectual ability, and cultural background). The next sections review empirical findings that tested the premises of the Risk-Need-Responsivity (RNR) model, as well as critiques of the ways in which each key construct has been measured.

### **Risk Principle**

Andrews and Bonta (2010) claimed that the risk principle is based on several premises: 1) validated risk assessment instruments can distinguish between lower and higher risk levels for reoffending; 2) the level or intensity of an intervention should depend on the level of risk assessed, and 3) harm can be done when overly intensive interventions are applied to lower risk offenders. Accordingly, the risk principle posits that, although minimal or no intervention may suffice for low-risk offenders, intensive—and often extensive treatment—services are required for high-risk offenders in order to reduce their likelihood of engaging in future criminal activities effectively (Andrews, Bonta, & Hoge, 1990).

The risk principle’s significance can be described better through a discussion of three vital concepts: allocation of limited correctional resources, contagion effects, and disruption of pro-social attributes. Efficient allocation of resources is an overarching issue in correctional agencies, given that few agencies can afford to provide programs and services to all offenders. Accordingly, rehabilitative efforts should be directed to areas in which the greatest need is exhibited, and where the strongest effects can be obtained. Empirical research

has demonstrated that establishing a therapy plan and adjusting the frequency and length of a program according to the risk principle maximizes the efficient use of resources, and further suggests that higher risk offenders should be offered priority in funding, placement, and treatment over lower risk offenders (Lowenkamp, Latessa, & Smith, 2006; Lowenkamp & Latessa, 2004).

Further, correctional researchers have demonstrated that increased exposure to the criminal justice system and related intervention services has a negative influence on overall well-being and the recidivism rate of low-risk offenders (Rice & Harris, 1997). For example, when low-risk offenders are assigned to more intensive correctional programs, they tend to get exposed to higher risk individuals. This provides low-risk offenders with more opportunities to associate with serious criminals and adopt antisocial lifestyles. Most troubling, placing low-risk offenders into intensive interventions can actually increase, rather than decrease, their risk for recidivism following treatment, as it disrupts low-risk offenders' preexisting pro-social networks, including stable employment, family support, and opportunities for education (Lowenkamp & Latessa, 2004, 2006). Hence, researchers have suggested that providing diverse programs and adjusting treatment levels should be given a high priority when dealing with first time or low-risk offenders (Dodge, Dishion, & Landsford, 2006).

With respect to the empirical status of the risk principle, a growing body of research suggests that correctional programs are most effective when administered according to the risk principle (Andrews et al., 1990; Bonta, Wallace-Capretta, & Rooney, 2000; Dowden & Andrews, 1999a, 1999b, 2000; Lowenkamp & Latessa, 2004; Gottfredson, Wilson & Najaka, 2002; Wilson, Lipsey, & Derzon, 2003). The literature shows that higher risk offenders tend to respond more positively to correctional interventions by comparison to moderate or low-risk offenders. This significant interaction between risk level and treatment intensity has been

observed among incarcerated populations (Andrews et al., 1990b), and juvenile (Dowden & Andrews, 2000; Lowenkamp & Latessa, 2002; Wilson et al., 2003), and female offenders (Dowden & Andrews, 1999a; Lovins, Lowenkamp, Latessa, & Smith, 2007).

In an early risk principle study, Andrews and colleagues (1990b) examined the influence of correctional programming in 85 studies and found a greater treatment effect for higher risk compared to lower risk cases. However, their methodology was criticized because they failed to describe sufficiently how they defined offender risk. In response, Andrews and Bonta (1998) reexamined the data from Andrews et al.'s study and estimated offender risk by looking at what percentage of offenders in a group who received treatment had prior records. The results verified that adherence to the risk principle enhanced treatment effects. For example, treatment programs administered to groups with primarily high-risk offenders resulted in approximately an 11% reduction in recidivism, while there was only a 2% reduction in post-treatment recidivism for groups with mixed (low and high) risk offenders.

In a meta-analysis of 200 studies on juvenile offenders, Lipsey and Wilson (1998) also found that treatment in non-institutional settings had a greater effect on reducing recidivism when “all” offenders in a treatment group had a history of criminal behavior by comparison to when a “majority” in a treatment group had a history of illegal activity. They also observed that the effectiveness increased significantly when treatment programs were administered to groups of juveniles with violent offense records, as compared to groups of non-violent juveniles. Although Lipsey and Wilson found no link between risk level and program effectiveness in data on institutionalized offenders, they concluded that correctional interventions serving a greater portion of higher risk cases were overall more effective than those that did not.

In their three comprehensive meta-analyses, Dowden and Andrews (1999a, 1999b, 2000) found strong evidence that supported the risk principle. First, Dowden and Andrews



(1999a) reviewed 26 correctional intervention studies of female prisoners, in which they defined high-risk cases as ones in which a majority of the participants had a criminal history. The findings of their first meta-analysis showed that programs that focused primarily on high-risk offenders had a greater effect size compared to programs that targeted medium or lower risk offenders (19% vs. -0.4%).

Next, in their 1999b study, they examined this same relationship in a sample of 229 studies that reported the influence of correctional treatment programs with incarcerated criminals. This analysis revealed that programs that adhered to the risk principle produced better treatment outcomes compared to their counterparts (average effect size: 0.13 vs. 0.03). Finally, their 2000 study reviewed 35 studies of violent offenders and concluded that interventions that followed the risk principle had a slightly greater influence in reducing crime than interventions that did not. However, the difference in average effect sizes (0.09 vs. 0.04, respectively), was not statistically significant.

Results of a meta-analysis reported by Lowenkamp et al. (2003) provided similar support for the risk principle. After examining 33 independent effect sizes from 22 drug court studies, the researchers found that if most offenders had a prior record, drug court programs were twice as effective in reducing recidivism. Specifically, programs in which more than 50% of the participants had a criminal record had a decreased average effect size of 10%, while programs in which less than 50% of the participants had a record had a decreased average effect size of only 5%. Two additional meta-analyses conducted on school-based interventions demonstrated a similar trend, revealing that programs that target higher risk populations were more successful in decreasing the frequency of conduct and aggressive behavioral problems (Wilson et al., 2003). The authors concluded that in order to maximize treatment effects, school-based interventions should focus on higher risk students rather than on the general student population.

Lowenkamp and Latessa (2005) also examined the relationship between treatment effectiveness and risk level using data gathered from 53 community-based residential programs in Ohio. After estimating the risk level of 7,366 offenders referred to a residential program and 5,801 offenders on parole/probation based on criminal history, demographic information, and the existence of psychological/substance abuse problem(s), they compared their post-release recidivism rates. Results indicated that in three residential correctional facilities that provided similar services and treatment for all offenders, high-risk offenders experienced a significant reduction in recidivism (34%, 32%, and 30%, respectively) while low-risk offenders experienced a considerable increase in reoffending (7%, 11%, and 29%, respectively) relative to the probationer/parolee group. Based on these findings, Lowenkamp and Latessa concluded that high-risk cases responded best to residential placement, whereas low- and moderate-risk cases were best served by probation. A study of female offenders conducted by Lovins and colleagues (2007) found similar results, in which higher risk female offenders who received treatment in a residential setting had lower re-arrest rates than a risk-controlled comparison group, whereas lower-risk female offenders showed an increased likelihood of recidivism than a comparison group.

More recently, Lowenkamp et al. (2006) reported additional findings after combining parolee samples ( $n = 13,676$ ) gathered from 97 correctional programs. Recidivism rates for offenders in residential programs (eg., community-based correctional facilities and halfway houses) were compared to those for offenders in non-residential programs (e.g., day reporting, electronic monitoring, and intensive supervision). The authors found that program type, amount of time the offender remained in the program, and treatment involvement were all significant predictors of recidivism (returned to prison for any reason), particularly for high- risk offenders. Their findings revealed that “the correctional programs included in these analyses, whether residential or nonresidential, showed an increase in recidivism rates unless

offenders who were higher risks were targeted and provided more services for a longer period of time” (p. 88). The authors concluded that, unlike low-risk offenders, high-risk offenders require a sufficient length of time to take advantage of any treatment programs or correctional treatment services that target their identified criminogenic risk factors directly in order to reduce their probability of recidivism.

### **Summary of the Risk Principle**

In summary, existing research provides clear empirical support for the risk principle—targeting higher risk offenders results in a greater reduction in recidivism. In addition, some research has indicated that programming directed to lower risk offenders increases their recidivism by disrupting preexisting pro-social ties (Dowden & Andrews, 1999b). Although the risk principle has not been shown to be effective in every study (e.g., Gaes et al., 1999) or meta-analysis (e.g., Dowden & Andrews, 2002; Lipsey, 1992), empirical evidence from much correctional intervention research has shown generally that adhering to the risk principle increases the overall effectiveness of correctional programming significantly.

### **Need Principle**

The second important element in the theory of principles of effective correctional intervention is the need principle, which stresses the importance of identifying and targeting an offender’s criminogenic needs in order to reduce reoffending effectively (Andrews & Bonta, 2010). The need principle draws a critical distinction between criminogenic needs and psychosocial functioning, or non-criminogenic needs. Criminogenic needs refer to dynamic risk factors that are correlated significantly with a greater risk of reoffending (Andrews & Bonta, 2010). Conversely, non-criminogenic needs or psychosocial functioning are aspects of an individual or his/her circumstances that, if altered, may not have a direct influence on criminal activity, such as low-self esteem, depression, anxiety, and fear of official punishment

(Dowden & Andrews, 1999; Gendreau, Little, & Goggin, 1996).

Notably, criminogenic needs are quite different from psychosocial functioning needs. Criminogenic needs can help predict future criminal behavior directly. In contrast, psychosocial functioning needs influence how well an individual will function in society and in correctional interventions. That is, psychosocial functioning needs influence an individual's ability to live a productive life, but are not necessarily associated with recidivism. For example, correctional intervention that merely focuses on enhancing self-esteem, which is a non-criminogenic need, runs the risk of creating confident criminals rather than law-abiding citizens.

Criminogenic needs that can be improved over time are referred to as dynamic risk factors. They include such behaviors as substance abuse, antisocial thinking, and criminal associations. Criminogenic factors that are invariant, such as the number of prior arrests and age at first incarceration, are referred to as static risk factors. Andrews and Bonta (2010) asserted that static risk factors should be considered when making a decision regarding treatment placement (e.g., whether an individual should receive treatment or not), but that when matching individual offenders with an appropriate treatment service based on their identified criminogenic needs, the focus should be on dynamic risk factors.

They proposed eight key criminogenic risk/need factors that must be addressed in a treatment program: 1) a history of antisocial behavior; 2) antisocial personality; 3) antisocial attitudes/cognitions; 4) antisocial associates; 5) family/marital status; 6) employment/education; 7) leisure/recreation, and 8) substance abuse. Table 1 presents an overview of these eight critical risk/need factors, as well as suggestions for treatment.

The first four needs listed above are referred to as the “big four criminogenic needs” and, compared to the remaining factors, are the most robust and predictive of negative outcomes. In fact, these key factors represent a single underlying construct: a criminal

lifestyle. The criminal lifestyle is the most essential target for correctional treatment services, as it reflects a global construct that encapsulates the repetitive deviant decision-making patterns of offenders, the antisocial values that influence engagement in criminal behavior, and the lack of social support that encourages criminal conduct (Laub & Sampson, 2003; Lipsey & Landenberger, 2006; Pratt & Cullen, 2000). Relevant studies have indicated that these four key criminogenic needs should be evaluated adequately and then targeted in treatment programs (Andrew & Bonta, 2002). For example, altering antisocial attitudes through intervention leads to a decreased probability of further criminal activity because how a person thinks affects how s/he behaves. The latter risk factors, with the exception of substance abuse, have been found to be less critical predictors of recidivism, as they usually affect how well an individual functions in society (Andrews & Bonta, 2010).

A growing body of research has demonstrated that certain criminogenic needs (e.g., antisocial personality, deviant peers, and antisocial values) are more robust predictors of reoffending than are others (Gendreau, Little, & Goggin, 1996; Bonta, Law, & Hanson, 1998; Gendreau, et al., 2002; Lowenkamp, 2003; Hanson & Morton-Bourgon, 2004). These studies have shown that if dynamic criminogenic factors are altered adequately, a considerable reduction in criminal activity may be achieved. Through a series of meta-analytic studies, Andrews and colleagues reported solid support for the application of the need principle among violent juveniles (Dowden & Andrews, 2000) and female offenders (Dowden & Andrew, 1999a), suggesting that adhering to the need principle results in a substantial difference in effect sizes (0.26 versus. 0.04). Subsequently, Andrews and Bonta (2010) found that correctional interventions that target criminogenic needs primarily produced a significant reduction in recidivism (20%) relative to programs that did not.

Table 1. The Central Eight

<b>Criminogenic Needs</b>	<b>Treatment Targets</b>
<p><b>Antisocial Behavior:</b> Explosive, aggressive or harmful behavior toward others</p>	<p>Increase pro-social behavior by reinforcing pro-social benefits supporting a crime-free life style.</p> <p>Develop clear, consistent and proximate reward and consequence system for addressing behaviors.</p> <p>Teach, model and reinforce pro-social alternatives, especially in high-risk situations</p>
<p><b>Antisocial Personality Pattern:</b> Impulsive, sensation seeking, risk taking aggressive, manipulative, and exploitive</p>	<p>Increase self-control and delayed gratification skills</p> <p>anger and conflict management, problem solving and reinforce pro-social, reciprocal interpersonal interactions.</p>
<p><b>Antisocial cognition:</b> Values, belief, feeling, and cognitions that contribute to personal identity that favors and reinforces criminal behavior</p>	<p>Address cognitive distortions and rationalizations that maintain a criminal identity.</p> <p>Build, practice, and reinforce new cognitions and attributions that lead to positive outcomes through cognitive restructuring and cognitive behavioral therapies.</p>

Adapted from Andrews and Bonta (2010)

Table 2. The Central Eight (Continued)

<b>Criminogenic Needs</b>	<b>Treatment Targets</b>
<b>Antisocial Peers:</b> Preferring to associate with pro-social peers and isolation from anti-criminal peers and social contexts	Reduce and eliminate association with delinquent peers and increase opportunities for regular association with anti-criminal peers and institutions (i.e., school, church, clubs, and sport teams).
<b>Family:</b> Chaotic and poor quality family relationships that have minimal or no pro-social expectations regarding crime and substance abuse	<p>Increase pro-social communication, nurturance, structure, supervision, and monitoring in the family.</p> <p>Address dysfunctional boundaries and role confusion.</p> <p>Implement behavioral management system that provides for consistent rewards for pro-social family interactions.</p>
<b>School/Work:</b> Poor performance and limited engagement with school or work, resulting in dissatisfaction and avoidance of these institutions	<p>Increase school engagement and performance in work and school through remediation of barriers to satisfaction (i.e., Individualized Education Plan, additional job training or alternate job placement).</p> <p>Implement monitoring and behavioral reinforcement program to increase consistent attendance at school and work.</p>

Adapted from Andrews and Bonta (2010)

Table 3. The Central Eight (Continued)

<b>Criminogenic Needs</b>	<b>Treatment Targets</b>
<b>Leisure &amp; Recreation:</b> Limited involvement in anti-criminal leisure activities	Expose youth to a variety of pro-social leisure and recreational activities. Increase opportunities for regular involvement in preferred activities and reward milestones in achievement
<b>Substance Abuse:</b> Use and abuse of alcohol, tobacco, or other drugs (ATOD)	Reduce substance use through targeted treatment. Increase supervision and reduce access to ATOD using peers. Increase capacity to cope with stressors through lifestyle changes like regular exercise, sleep, and nutrition.

Adapted from Andrews and Bonta (2010)

The concept of the need principle was refined subsequently by Gendreau et al. (2002), who explored how the number and proportion of criminogenic needs targeted by a treatment influences effect sizes. In their meta-analysis, programs that targeted more than four criminogenic needs produced approximately a 30% reduction in recidivism, while programs that targeted fewer than three criminogenic needs did not have a considerable influence in reducing recidivism. These findings illustrate that programs that focus only on one or two risk factors may not produce major changes in offending behavior. Thus, to reduce the likelihood of engaging in criminal activities effectively, adjusting the number of criminogenic needs that are addressed in the intervention is as important as targeting the



proper dynamic risk factors.

Similarly, French and Gendreau (2006) tested the effect of the need principle by examining the number of needs targeted in a prison setting. Based on findings from a meta-analysis of 68 studies, they reported that programs that targeted three to eight criminogenic needs decreased prisoner misconduct by 29%, whereas programs that targeted one or two criminogenic needs decreased misconduct by just 16%. Those programs that did not target identified risk factors adequately failed to produce significant reductions in misconduct.

Lowenkamp (2004) found a similar trend in a sample of offenders in a residential, community-based correctional setting. Lastly, Prendergast et al. (2002) tested whether or not applying the need principle in a diverse set of drug-abuse treatment programs had a significant influence on recidivism. Drawing from data containing 243 independent comparisons, these authors found that the need principle exerted a substantial influence on recidivism.

In addition to the four key criminogenic needs, there are other dynamic needs that are linked less directly to reoffending, such as employment, mental health, and quality of family relations (Andrews & Bonta, 2010). Andrews and Bonta asserted that, although these risk factors do not necessarily predict recidivism, they are still important in an offender's ability to function, and thus should be addressed in correctional interventions.

Previous research supports this assertion. When examining these other risk factors, Huebner and Berg (2011) found that offenders who did not graduate from high school tended to recidivate more frequently than did high school graduates. They explained that, although lower educational attainment does not *cause* a person to reoffend, it may affect overall intellectual ability and thereby influence an offender's ability to obtain stable employment, a factor that generally has been shown to be correlated strongly with continued criminal conduct. Other studies also have found a similar interrelated ancillary trend when

investigating the influence of mental health (Feucht & Gfroerer, 2011) and housing (Makarios et al., 2010) on recidivism.

### **Summary of the Need Principle**

The need principle posits that effective offender therapies should address primarily the offender's identified criminogenic needs and attempt to modify those of his/her dynamic need factors that are amenable to change. Andrews and Bonta (2006) identified four critical dynamic risk/need factors that have the most influence, including antisocial personality and deviant peers. In several meta-analyses, they reported significant correlations (0.16 through 0.50) between the "big four" criminogenic factors and reoffending. By identifying the number and types of these needs that an offender possesses, it becomes possible to differentiate offenders who are more entrenched in a criminal lifestyle and who should therefore be provided with treatment that is more intensive in order to effectively decrease their likelihood of reoffending. Subsequent studies examined whether application of the need principle improved program effectiveness overall. That research demonstrated that programs that targeted dynamic criminogenic needs properly tended to generate positive treatment outcomes relative to programs that did not adhere to the need principle. These findings suggest that identifying and targeting an offender's criminogenic needs should be an important part of treatment services.

### **Responsivity Principle**

The responsivity principle is the third core concept in the RNR model. Andrews and Bonta (2010) defined responsivity as the personal characteristics (i.e., emotional problems, cognitive functioning, level of motivation, and readiness to change) that can affect offenders' engagement in treatment. Responsivity has evolved into two forms, general Responsivity and specific Responsivity.

The general responsivity principle suggests that the content of an intervention must

include cognitive behavioral elements. Cognitive social learning strategies include the adequate use of positive and negative reinforcement and punishment, learning associations through classical conditioning, and problem solving skills (Dowden & Andrews, 2004). The use of cognitive social learning methods is encouraged strongly among practitioners and researchers because they have been found to be the most effective methods, regardless of the type of offender.

The findings from numerous meta-analyses, for example, have demonstrated consistently that the most effective treatment programs are cognitive-behavioral in nature (Landenberger & Lipsey, 2005). In their meta-analytic review of over 200 corrections studies, Andrews and Bonta (2010) reported that cognitive behavioral treatment programs generated approximately 20% greater reductions in reoffending by comparison to non-cognitive behavioral programs. Similarly, Latessa and colleagues (2009) reported that a majority of cognitive behavioral interventions (73%) had a significant effect size coefficient greater than 0.15.

The second element, the specific responsivity principle, indicates that consideration should be given to individual traits that may affect an offender's ability to benefit from a particular treatment (Andrews et al., 1990). Thus, specific responsivity requires therapists to match the content and pace of treatment sessions to specific client characteristics, such as personality and cognitive maturity. Further, this principle also takes into account factors of external responsivity by emphasizing the use of active and participatory methods, as well as consideration of the individual offender's life circumstances, cultural background, etc.

Research has demonstrated that adhering to this precept results in treatment success and significant decreases in reoffending (Wormith & Olver, 2002). Factors that are important to the specific responsivity principle are varied but usually include: ethnicity; gender; socioeconomic status; anxiety; depression; motivation, and mental illness. Although many of

these responsivity traits are not criminogenic factors, in that they are not associated directly with reoffending, some may function as intervening variables that amplify the effect of criminogenic risk factors, given that certain responsivity factors are still observed more frequently in offender populations, such as poor social and verbal skills, inadequate problem solving skills, and concrete styles of thinking (Bonta, 1995).

When it comes to empirical status of specific responsivity principle, researchers argue that it is too soon to draw any definite conclusions, because the issue of specific responsivity to correctional treatment is a rather underexplored area in correctional research (Serin, 1998; Ward et al., 2004). Unfortunately, the responsivity topic has received far less attention than the role of dynamic criminogenic risk factors in shaping criminal conduct, thus research on responsivity factors is underway currently to create adequate measures to test various specific responsivity factors.

Nonetheless, a few studies attempted to examine the effectiveness of responsivity predictors. One of the specific responsivity elements that researchers have been most active in exploring is how offender motivation influences treatment outcomes. Based on substance abuse treatment models, it has been theorized that during the process of resolving a problem, an individual passes through a number of identifiable stages of change (Prochaska & Diclemente, 1996). For example, a person may participate in an intervention while unmotivated, but later become aware of a problem and attempt to make a significant change in his/her life, thus amplifying the expected treatment effects. The literature has shown that participant motivation is a critical factor in explaining treatment effectiveness among drug and alcohol addicts (Bubner, 1999) and even general offender populations (McMurran et al., 1999). Serin (1998). This approach is, however, criticized for ignoring the influence of procedural factors. For a majority of offenders, for instance, the decision to participate in an intervention is affected strongly by administrative actions, such as the amount of coercion

used to persuade an offender to participate in a program (i.e., the likelihood that participation in an intervention may influence parole or release decisions).

Correctional studies have also tested other types of specific responsivity predictors. Research that investigated the effect of treatment readiness on treatment performance, for example, found a significant link between goal setting and treatment outcomes specified that the perceived need for treatment, optimism about treatment, perceptions regarding a proposed intervention, and staff were significant predictors of offenders' attendance in substance abuse and anger management programs.

One sub-area of specific responsivity that has received little attention is the cultural appropriateness of treatment interventions. Cultural inadequacy refers to a misguided total conceptualization of interventions and treatment activities that do not take into account program participants' cultural attributes. In Australia, for example, a considerable number of incarcerated offenders are from the indigenous community. Yet, it has been observed that Australia's correctional treatment programs are created primarily for offender populations in which such minority cultural groups are under-represented (Wallace, 1999). Accordingly, it has been argued that in order to maximize effectiveness, treatment interventions must be tailored to various cultural groups.

### **Summary of the Responsivity Principle**

According to RNR model, to effectively reduce recidivism, two types of responsivity factors should be adequately addressed in treatment services. The first element, general responsivity, involves placing offenders in evidence-based correctional treatment programs designed to decrease the probability of reoffending. Research has demonstrated that cognitive behavioral therapy decreases the likelihood of recidivism most effectively when compared to other interventions that include no elements of social learning or cognitive skills.

Specific responsivity principle suggests that treatment interventions should be

delivered in a style that is consistent with an offender's abilities and learning style. Research results in this area are, however, rather inconclusive; despite the fact that the specific responsivity principle strongly encourages delivering interventions that match an individual offender's abilities and lifestyle, individual differences are addressed rarely in most correctional settings. The dominant approach is to provide a treatment package in which a standard intervention is delivered to all types of offenders in an identical manner (Aos, Miller, & Drake, 2006; Lipsey & Landenberg, 2005).

Nonetheless, a few studies that explored the link between specific responsivity predictors and program effectiveness demonstrated a moderate association. Given that the inevitable consequence of the standard treatment model is decreased treatment effectiveness, it is critical to alter intervention conditions to accommodate individual differences through validated assessment tools (Aos, et al., 2006).

### **Treatment Integrity and Program Effectiveness**

As our knowledge of "what works" accumulates, correction scholars are challenged to disseminate this information systematically in order to ensure the successful development and delivery of quality treatment interventions. Although individual research and replication of the findings in meta-analyses has provided strong support for the rehabilitative approach, there remains a growing need to introduce a complete theory of correctional intervention that explains comprehensively why, how, and to whom they should be applied.

In this context, correctional researchers have attempted to introduce a more inclusive, systematic model to implement correctional interventions, and finally have developed the most reliable, empirically justified treatment paradigm—"therapeutic integrity" (Andrews & Bonta, 2010; Andrews et al., 1990; Gendreau, Smith, & French, 2006; Smith, Gendreau & Swartz, 2009). The term "therapeutic integrity" or "treatment integrity" is a comprehensive conceptual framework that describes the extent to which correctional services that are

provided in practice compare to the theory and design specified originally (Andrews & Bonta, 2010; Latessa & Holsinger, 1998).

Over the past two decades, the influence of program integrity on program effectiveness has received consistent attention from researchers as a major area of concern in the field of corrections (Lowenkamp et al., 2006). While testing the concept of treatment integrity empirically, researchers have developed several assessment tools that measure the its degree (i.e., whether the intervention has a solid theoretical foundation or whether correctional agencies were capable of providing treatment integrity).

One of the best instruments of therapeutic integrity that Canadian scholars developed to implement their treatment theory was Correctional Program Assessment Inventory (CPAI-2000). Andrews and Gendreau (2001) operationalized each of the RNR principles into a set of guidelines to create the CPAI-2000<sup>2</sup>. More specifically, the CPAI-2000 uses the three principles of effective correctional practice as a template for the ideal treatment intervention and gauges how closely an intervention adheres to this ideal model.

Since CPAI-2000<sup>3</sup> was designed to be a versatile evaluation tool that is applicable to various types of correctional services, this assessment tool has been accepted widely in diverse correctional settings to evaluate more than 400 correctional practices in Canada and the U.S. (Latessa &Holsinger, 1998; Lowenkamp, 2004; Gendreau, Smith, & French, 2006; Smith, Cullen, & Latessa, 2009; Smith, Gendreau, & Swartz, 2009).

Unfortunately, the results of these assessments are disheartening. A majority of

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<sup>2</sup> The administration of the CPAI-2000 begins with data collection during site visits, when six substantive areas of the program under review are scored. The six domains of the CPAI-2000 include: program implementation; client pre-service assessment; characteristics of the program; characteristics of practice and staff; program evaluation, and a final category with diverse miscellaneous items. See the CPAI-2000 scoring manual for more detailed information (Gendreau & Andrew, 2001).

<sup>3</sup> The latest version of the instrument, CPAI-2000, includes 65 items that can be used to evaluate six features of an agency that delivers an intervention. Each domain of the CPAI-2000 is rated as very satisfactory (70% and above), satisfactory (50-69%), or unsatisfactory (49% and below). Based on these cut-off guidelines, the CPAI-2000 has been used to determine whether agencies deliver interventions marked by major program deficits or are effective in delivering services (Gendreau, Goggin, & Smith, 2001).

treatment programs that have been evaluated with the CPAI-2000 failed to receive a passing grade, and only a small portion of interventions received a rating of very satisfactory (Dowden & Andrew, 2004; Gendreau, Goggin, & Smith, 1999; Lowenkamp et al., 2006; Nesovic, 2003). Latessa and Holsinger (1998) summarized the common structural issues revealed in assessments performed with the CPAI-2000, stating that, "...since programs are rarely designed around a theoretical model, it was not surprising to find a lack of a consistently applied treatment model in place" (p. 26).

Because the CPAI-2000 estimates the degree of adherence to the three principles of effective correctional intervention, it is assumed that treatment programs with high integrity should produce a significant reduction in recidivism. Relevant research has shown that total scores on the instrument are associated significantly with diminished recidivism, thus demonstrating a link between program integrity and recidivism (Holsinger, 1999; Lowenkamp, 2004; Lowenkamp et al., 2006).

For example, Nesovic (2003) reviewed 173 studies of correctional interventions and estimated 266 effect sizes between program integrity and reoffending in his meta-analytic study. As an outcome, Nesovic reported a significant association between high CPAI scores and lower rates of recidivism. Treatment programs that obtained high scores for program quality were associated with a 20% reduction in reoffending while programs that received medium or low scores for program quality produced 11% and 1% reductions in reoffending, respectively.

In an assessment of 38 community-based correctional interventions, Lowenkamp, Latessa, and Smith (2006) also presented a similar trend. Although the comparison group recidivated at lower rates than did the treatment group for a majority of the programs (73%), they found that the total CPAI-2000 score predicted all three of the outcome measures significantly (i.e., new offense, technical violation, and new incarceration). More specifically,



a 41% difference in re-incarceration rates was observed between programs that had high scores on the CPAI-2000 and those that had low scores. Based on these findings, Lowenkamp and colleagues argued that treatment integrity significantly predicted high reductions in recidivism and that the correctional programs that received unsatisfactory scores on the treatment integrity instrument must address their therapeutic and administrative barriers to successful delivery and implementation.

In addition to the findings of CPAI-2000 studies, other research has found a strong causal link between treatment integrity and program effectiveness. In meta-analytic research pertaining to cognitive-behavioral programs, Lipsey and Landenberger (2005) found that greater correctional intervention integrity was associated significantly with larger treatment effects. Similarly, in a meta-analysis of 273 studies, Andrews and Dowden (2005) reported that effect sizes were larger for interventions that considered core elements of program integrity (i.e., staff were trained properly in the delivery of a specific treatment service, staff received clinical supervision, and risk assessment was administered adequately) relative to programs lacking these components of treatment integrity.

In a meta-analysis of interventions for juvenile delinquents, Lipsey (2009) found a significant association between program quality and the effect size of psychological treatment interventions (e.g., counseling, reinforcement and punishment, pro-social skill building). Further, positive associations were also found in investigations of the effect on recidivism of individual program integrity factors, including adequate training and certification of staff (Simons et al., 2010), assignment of offenders to proper treatment services (Andrews, Bonta, & Wormith, 2006), use of manuals for treatment protocols (Mann, 2009), and active communication among treatment and correctional staff (Taxman & Bouffard, 2000).

By incorporating indicators of the CPAI-2000 that have been proven empirically to be associated with recidivism, researchers from the University of Cincinnati developed a new

assessment tool of therapeutic integrity, which is called the Evidence-Based Correctional Program Checklist (CPC)<sup>4</sup>. Similar to the CPAI-2000, the CPC was designed to assess how closely correctional interventions meet known principles of effective correctional practice.

In terms of its conceptual structure, the CPC is divided into two areas: program capacity and program content. Program capacity measures whether or not a treatment program has the ability to deliver evidence-based treatment services for targeted offenders<sup>5</sup>. Program content concentrates on estimating the degree to which correctional programs follow the principles of RNR<sup>6</sup>. More than 40,000 offenders (juvenile and adult) and over 400 correctional programs were evaluated to estimate the validity of the tool and a strong correlation ( $r = 0.60$ ) was found between the CPC items and reductions in recidivism (Lowenkamp, 2004).

In 2010, a large study of 64 community-based correction facilities was conducted by Latessa and colleagues to examine the effectiveness of the interventions on recidivism, while taking program integrity into account (Latessa, Lovins, & Smith, 2010). Data were analyzed and presented separately for the CBCF and two comparison groups (ISPs and parolees), and HWH and ISP cases.

In the initial stages of analysis, the results provided minimal support for treatment; program participation predicted continued criminal behaviors significantly, regardless of program type (i.e., CECFs and HWHs) and how recidivism was measured (i.e., new conviction, and new incarceration). When only those who completed the treatment successfully were included in the model, however, program involvement improved the

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<sup>4</sup> This instrument includes a total of 77 items worth a total of 83 points. The scores in all sub-domains are summed and the same scale is used to compute the overall assessment score. Each area and all of the domains are scored and rated as either highly effective (65-100%); effective (55-64%); needs improvement (46-54%), or ineffective (45% or below).

<sup>5</sup> The capacity area contains three subordinate domains: leadership and development, staff, and quality assurance.

<sup>6</sup> The content area includes two subordinate domains: offender assessment and treatment.

treatment effects substantially; CBCFs produced a slight decrease in the rate of new convictions when compared to ISP groups, while HWHs produced approximately a 5% reduction in recidivism relative to the ISP group.

More importantly, Latessa and colleagues suggested that a favorable effect of residential programs could be amplified by considering program integrity. Indeed, results showed that higher quality programs which had a higher score on the five sub-domains of the CPC produced better outcomes relative to those of lower quality programs.<sup>7</sup> Specifically, the program director's supervision, coed programs, staff skills, clinical meetings, program training, clinical supervision, having exclusion criteria, targeting criminogenic needs, providing cognitive behavioral therapy, offering gender specific treatment, and following the guidelines for appropriate use of punishment were found to have a significant effect on treatment effectiveness.

More recently, using data collected from Ohio and Pennsylvania correctional facilities, Lovins (2012) attempted to identify program characteristics that were most pivotal in reducing recidivism and how the effect sizes of those characteristics were moderated by the gender of participants. For example, program duration,<sup>8</sup> staff's perceptions of treatment, qualifications of staff, use of cognitive behavioral therapy, and treatment opportunities for better family problem solving skills were found to be important program characteristics only for female offenders. On the other hand, the program director's involvement, staff stability, use of validated risk/need assessment tools, targeting higher risk cases, and providing substance abuse programs and anger management interventions were found to be critical program traits only for male offenders.

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<sup>7</sup> In order to identify program characteristics that were associated significantly with reduced recidivism, Latessa et al. (2010) defined program effectiveness as a difference in recidivism between comparison and treatment groups and then computed weighted  $r$  coefficients between CPC items and program effectiveness.

<sup>8</sup> Program duration refers to the length of time that a treatment is in effect.

## **Summary of Treatment Integrity and Program Effectiveness**

Over the past two decades, researchers have conducted studies to evaluate the effectiveness of diverse correctional interventions, and their results have shown clearly that the more a treatment intervention adheres to the principles of effective correctional intervention, the greater its effectiveness in reducing recidivism. Thus, in order to enhance the positive influence of correctional services, it is essential to consider “therapeutic integrity.” The evidence accumulated for the “what works” paradigm has also been used to define evidence-based correctional practices that are designed to promote more efficient use of the limited resources of the criminal justice system in various correctional settings by emphasizing the importance of having a solid theoretical foundation for correctional interventions (Lipsey & Cullen, 2007).

### **Treatment Integrity and Program Completion**

The literature reviewed in the sections above illustrates clearly that higher levels of treatment integrity in correctional rehabilitative intervention have correlated consistently with decreased criminal activities after leaving treatment. Thus, well-designed and implemented rehabilitative programs tended to generate more beneficial outcomes relative to those that were not (Lipsey & Cullen, 2007; Smith, Genreau, & Swartz, 2009). However, many questions still remain with respect to how such system-level effects of treatment integrity alter the probability of individual-level recidivism.

Although early studies have helped validate the theory of treatment integrity to some degree, the emphasis typically has been to assess the indirect effects of program integrity on program effectiveness through a correlational analysis between the level of program integrity and the degree of reduction in recidivism (Lowenkamp, Latessa, & Smith, 2006). Therefore, the research question that requires further exploration is how do we test the relative effect

size of different levels of treatment integrity on program effectiveness directly?

In addition to the issue of measuring the direct influence of different levels of program integrity on recidivism in a causal statistical model, it is worth noting that considerably less attention has been given to the nature of the relationship between treatment integrity and program completion. Although some studies have indicated that program completion alone can play a significant role in enhancing the general effectiveness of correctional interventions by helping offenders benefit fully from the intervention (Beyko & Wong, 2005; Hanson & Bussiere, 1998; McMurran & Theodosi, 2007; McMorran, Huband, & Overton, 2010; Lockwood & Harris, 2013), others have suggested that treatment integrity is linked significantly to program completion because it may facilitate active participation among offenders by providing services that meet their particular needs (Lowenkamp & Latessa, 2005; Strauss & Gregory, 2000).

For example, researchers at the National Development and Research Institutes proposed a possible connection between treatment integrity and program completion using a sample of 101 female offenders incarcerated in federal prisons (Strauss & Gregory, 2000). Their analyses of both quantitative and qualitative data revealed that participants who believed that a program was high quality tended to complete it more often and felt more empowered by their experience in treatment. Participants who left early, on the other hand, reported that they dropped out mostly because of conflicts or disagreements with the program's content or rules.

Conversely, in a qualitative analysis of 120 juvenile offenders who were assigned to either cognitive behavioral treatment programs or non-directive discussions, Feldman and his colleagues found no significant interaction between treatment integrity and program completion (Feldman & Wodarski, 1983; Feldman, Caplinger, & Wodarski, 1983). Their self-report results showed that youth who failed to complete a high quality treatment intervention

(i.e., programs that were managed by experienced group leaders and encouraged the use of cognitive behavioral strategies) did not improve on a series of pro-social behavioral observation measures as much as those who did complete the program. More importantly, those who did not complete a low quality program actually deteriorated considerably more than those who did complete the program, thus suggesting no connection between treatment integrity and attrition.

However, it is somewhat premature to make any definitive statements about interactions between treatment integrity and program completion, given that both previous studies need to be understood in the context of a few caveats. While Strauss and Gregory's (2000) qualitative analysis was better equipped to show a clear connection between two variables of interest, their research suffered from a wealth of measurement issues because they relied primarily on program participants' perceptions of the quality of the treatment experience, rather than using data collected with validated, objective assessments tools.

The work of Feldman et al. (1983) also was not without limitations, as they used a qualitative research design that lacked statistical analysis, and focused on a less reliable source of recidivism, including self-report survey (Farrington, Jolliffe, Hawkins, Catalano, Hill, & Kosterman, 2003). Therefore, more rigorous forms of testing are required to determine why some offenders complete rehabilitative interventions, while others leave early, and how treatment integrity is related to this association.

### **Summary of Treatment Attrition and Program Effectiveness**

Despite the promising findings with respect to rehabilitative correctional interventions in general, the results of extant studies on the ideal therapeutic conditions of treatment programs that maximize effectiveness must be interpreted within the context of a few theoretical limitations. For example, only a few studies have examined how distinctive levels of program integrity have differential influences on program effectiveness. More importantly,

no study has yet explored the potential interactive connection between therapeutic integrity and program completion for various reasons, such as limitations in the research design and methodological complexity.

### **Conclusions**

The body of correctional literature that has been conducted to date has suggested that adherence to the principles of effective correctional practice is the key ingredient in the successful implementation of treatment interventions for individuals in the criminal justice system. However, due to the limitations in statistical modeling and research design in much of the research, only a few studies have examined how different levels of treatment integrity have a distinctive effect in reducing criminal activities following treatment and how this treatment integrity effect interacts with program completion to reduce recidivism. Hence, hierarchical linear modeling was used in this dissertation to address the nature of the relationships among treatment integrity, completion, and subsequent criminal behavior. Detailed information regarding measurements, the data collection procedures, and statistical modeling are discussed in the next chapter.

## **CHAPTER THREE**

### **Introduction**

This chapter describes the methods that were employed for data collection and analysis. The following topics are addressed in each section: 1) a review of the research questions; 2) a description of program participants; 3) data collection procedures for individual level measures and a description of individual level variables; 4) data collection procedures for program level measures and a description of program level variables, and 5) the conceptual framework of hierarchical linear modeling. The primary source of the data used for this dissertation is the Ohio CBCF/HWH outcome study that was conducted in 2010 by the University of Cincinnati, Center for Criminal Justice Research (Latessa, Lovins & Smith, 2010).

### **Research Questions**

Numerous previous studies have examined the effect of program attrition and integrity separately. However, few correctional studies have attempted to explain possible interaction between these two variables. Hence, the goal of this dissertation was to address that deficiency. The following three research questions were examined in this dissertation:

- 1) Level-1 model: Does treatment completion alone have a significant effect in reducing recidivism?
- 2) Level-2 model: Is program integrity associated with recidivism? Do the different dimensions of program integrity have distinctive effects on the probability of criminal behaviors?
- 3) Interaction model: Does the effect of program completion on recidivism differ by levels of program integrity?



## **Program Participants**

The original 2010 Ohio CBCF/HWH study incorporated data from over 20,000 offenders and 64 programs (Latessa, Lovins, & Smith, 2010). Considering the primary purpose of this research, the sample size and methods of analysis were simplified accordingly. For example, the comparison group (ISP and parole/Post release control) were no longer used and 189 cases were eliminated from the analysis due to having inaccurate information on the program completion status.<sup>9</sup> In addition, a new conviction of a felony offense was used as the single outcome measure.

The program participants in this analysis included offenders who were assigned to one of 64 Ohio community-based residential facilities between February 1, 2006 and June 1, 2007. This period represents one year from the beginning and end of the data collection<sup>10</sup> (Latessa, Lovins, & Smith, 2010). Notably, the sample size varied across program sites depending on the number of offenders placed in the facility during data collection period.

With respect to the sample of analysis, the Halfway House (HWH) cases represented offenders who participated in one of 44 Ohio HWH programs in operation in 2006. The Community Based Correctional Facilities (CBCF) cases represented offenders who participated in one of 20 Ohio CBCF programs in operation in 2006. The HWH sample included 5,891 cases and the CBCF sample consisted of 4, 181 cases. Overall, the multilevel analysis presented in Chapter 4 was based upon the traits of 64 residential correctional programs and 10,072 offenders.

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<sup>9</sup> Approximately 4% of cases (n=189 out of 10,281) did not have an accurate program completion record.

<sup>10</sup> Program-level data were collected from August 2006 to December 2006.

### Individual Level Data Collection

Offender level data for the CBCF and HWH cases were extracted from the Community Corrections Information System (CCIS),<sup>11</sup> which is controlled by the Ohio Department of Rehabilitation and Correction (ODRC).<sup>12</sup> The data contain demographic information, criminal history, and current offense, county of supervision, identified criminogenic needs, program termination status, and employment.

Recidivism data for both HWH and CBCF cases were gathered by University of Cincinnati researchers through the Ohio Law Enforcement Gateway (OHLEG)<sup>13</sup> system. To determine the patterns of recidivism of program participants, two years of follow-up were used. Collection of the recidivism data began in April 2009 and ended in September 2009. Although a variety of reoffending measures was collected in the 2010 outcome study, re-conviction for a new felony offense was selected as the dependent variable to examine the relative effects of residential programs on recidivism.

### Program-Level Data Collection

Demographic information used for the analysis included gender and ethnicity; *Gender* was coded as male/female, and *Ethnicity* was coded as Non-White /White. A key control variable *Risk Level* was coded as 1 = low; 2 = moderate, and 3 = high.<sup>14</sup> Because no risk

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<sup>11</sup> The Community Corrections Information System (CCIS) refers to a computerized information system that is used to track the criminal history and progress of offenders under the supervision of the Adult Parole Authority. The CCIS is under the control of the Department of Rehabilitation and Correction. Access to CCIS is restricted to essential users only.

<sup>12</sup> The Ohio Department of Rehabilitation and Correction (ODRC) is the administrative department of the Ohio state government that operates state prisons for adults in Ohio.

<sup>13</sup> The Ohio Law Enforcement Gateway (OHLEG) system is an electronic information network that allows Ohio law enforcement agencies to share criminal justice data. The information that the OHLEG provides includes criminal histories, evidence submission, missing children, gangs, etc.

<sup>14</sup> A risk scale was created based on the following items: having a felony conviction; having more than two prior incarcerations; engaging in a property offense; having a substance abuse history; having an employment problem, and being less than age 40 (Latessa, Lovins, & Smith, 2010). All items were scored dichotomously, with 0 representing no such incident, and 1 representing occurrence of such an incident. Variables were weighted in order to give more weight to stronger factors. The weight was the difference in the percentage of any new conviction based upon the presence or absence of a risk factor. Further, separate weights were assigned to male and female offenders. The male risk score ranged from 0 to 64, while the female risk score ranged from 0 to 43. Once the risk score was computed, a visual inspection between risk score and

measure was administered consistently across the state at the time of the study, seven risk factor measures were incorporated to create a risk scale (Latessa, Lovins, & Smith, 2010). Specifically, the new risk scale was created based on the following items: age; prior incarceration; prior conviction; offense level<sup>15</sup>; offense category<sup>16</sup>; substance abuse problem, and employment problem. The correlation coefficient between the risk scale and recidivism was 0.27 (Latessa, Lovins, & Smith, 2010). Finally, the program completion was coded 1 to indicate successful completion of the intervention and 0 to indicate failure to complete the intervention. Termination status was dichotomized so that any case in the CCIS database marked successful was identified as successful completer, and any case marked anything other than successful was marked as an unsuccessful completer (Latessa, Lovins, & Smith, 2010).

In terms of the outcome measure, a new conviction for a felony crime was selected, because the recidivism literature has recognized it consistently as an accurate and readily available data source for repeat criminal behavior (Weisburd, & Britt, 2007). Furthermore, “arrest records” are considered to be a less valid measure of recidivism since they occur before the court reaches a verdict regarding the culpability of a defendant.

Using “re-incarceration” as the primary outcome measure also poses the risk of including offenders who were in prison for technical violations. It is important to note that most offenders in a residential placement facility tend to have conditions of supervision that are more stringent, as well as increased surveillance (Latessa, Lovins, & Smith, 2010). Hence, program involvement in general increases the odds of technical violations and thus may impair the validity of the current analysis. For this reason, a new felony conviction was

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reconviction was administered to create adequate cutoff scores. The female and male offenders were then categorized into three risk groups (low, moderate, and high) according to the cutoff score (Latessa, Lovins, & Smith, 2010).

<sup>15</sup> Offense level was coded as 0 = felony level 1 to 2; 1 = felony level 3 to 5.

<sup>16</sup> Offense Category was coded as 0 = non-property offense ; 1 = property offense.

chosen ultimately as the outcome measure. Table 4 provides a summary of individual level measures.

Table 4. Individual-Level Variables and Coding Scheme

Measures	Category	Coding
Race	White	0
	Non-White	1
Gender	Female	0
	Male	1
Risk Level	Low	0
	Medium	1
	High	2
Program Completion	No	0
	Yes	1

### **Program-Level Data Description**

A University of Cincinnati research team visited all 64 CBCF/HWH facilities between August and December 2006. Site visits consisted of structured interviews with program director(s), staff, and supervisors as well as program participants. In addition to offender files, a variety of program materials (e.g., treatment manuals, assessment tools, and treatment policies and procedures) was examined during site visits. In addition, treatment groups were monitored<sup>17</sup> and facilitation skills recorded. After completing the site visits, the research team integrated all relevant information from the site visit and then created a program summary form (Latessa, Lovins, & Smith, 2010). Finally, a database that contained 1,038 variables was created based on the program summary form.

<sup>17</sup> Site visits were scheduled on days that treatment groups could be observed (Latessa, Lovins, & Smith, 2010).

## **Program-Level Data Descriptions**

### **Program Integrity (CPC)**

Program integrity measures were created based primarily on the Evidence Based Correctional Program Check List (CPC)<sup>18</sup>. Developed by researchers at the University of Cincinnati, the CPC was designed to measure how closely treatment interventions meet the principles of effective correctional intervention (Lowenkamp & Latessa, 2003). Numerous studies have been conducted by the researchers of the University of Cincinnati to validate the indicators on the CPC and the outcomes have shown that all indicators included in the CPC are correlated highly with recidivism (Holsinger, 1999; Lowenkamp, 2003; Lowenkamp & Latessa 2003, Lowenkamp & Latessa 2000; 2005).

Although the items on the CPC served as the framework for creating the collection tools, a more systematic, additional approach was used to code in-depth information on all core program elements in the 2010 CBCF/HWH study (Latessa, Lovins, & Smith, 2010). In general, the CPC was designed to assess the following five areas of the correctional intervention: 1) program leadership and development; 2) staff characteristics; 3) assessment; 4) treatment, and 5) quality assurance. The data collected in these five areas can be described as follows (Latessa, Lovins, & Smith, 2010):

1) *Program leadership and development*: This domain considers the credentials of the program directors, in terms of educational and professional experience. Further, there is an item that evaluates the program director's involvement in program development, as well as the selection of staff and delivery of services. An item that measures the program's funding

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<sup>18</sup> Administering the CPC offers several advantages (Latessa, Lovins, & Smith, 2010). First, it is applicable to a wide range of correctional interventions and samples, including both juvenile and adult offenders. Next, the items on the CPC help researchers obtain insights into the "black box" of a treatment program, which an outcome study cannot provide. The final report of the CPC describes both the strengths and the weaknesses of the program so that the program director and staff can improve any vulnerable aspects of the program. Lastly, the CPC evaluation outcomes are usually produced in a relatively short period of time.

status and sustainability is also considered, in addition to an item that captures whether the programs are piloted prior to full implementation.

(2) *Staff Characteristics*: This domain identifies the educational and professional experience of the treatment staff. In addition, staff training, along with support and attitudes of the staff pertaining to the programming, is evaluated. Finally, whether or not clinical supervision is provided to the treatment staff is examined.

3) *Offender Assessment*: This domain addresses whether the program under review uses an actuarial standardized risk/need assessment tool that has been proven to be valid for their target population. In addition, there is an item that evaluates whether or not the assessment is used to identify offenders appropriate for the program(s). Whether or not the program assesses a range of key responsivity factors based on a validated assessment tool is also evaluated. The assessment section also considers whether or not the program has clear eligibility/exclusionary criteria.

4) *Treatment characteristics*: The items in the *treatment* domain assess: 1) whether or not the program targets primarily criminogenic needs; 2) whether or not the program's therapeutic model is centered around social learning and/or cognitive behavioral theory; 3) whether or not the program staff and participants are matched adequately to programming while considering specific responsivity factors; 4) whether or not the treatment intensity is adjusted based on the risk level of the participants; 5) whether or not the program assesses the appropriateness of rewards and punishments, as well as the process for doing so; 6) whether or not cognitive-behavioral treatment strategies are used to alter participants' criminal behavior; 7) whether or not the program trains participants' family members and provides aftercare services, and 8) whether or not the program has clear criteria to determine successful program completion.

5) *Quality assurance*: This domain captures whether internal and external review

strategies are used by a program under review for the purpose of maintaining the treatment model (e.g., observation of service delivery and surveying program participants' satisfaction with the program). Further, whether or not offenders are re-evaluated, as well as whether or not the program has gone through process and/or outcome evaluations and the outcomes of such evaluations are examined as well. Finally, the level of program integrity was measured in three categories of the CPC total score: 0-13 = low; 13-20 = moderate; 21+ = high. See Appendix A for more detailed coding information on CPC sub-scales.

### **Program Setting (CBCFs versus HWHs)**

Ohio's CBCFs are residential interventions established to manage adult felony probationers as an alternative to sending them to prison. These minimum-security, locked facilities were funded in response to prison overcrowding, with the first facility opening in the late 1970s. They are funded by the ODRC and operation is left to the local communities under a local facility governing board. CBCFs offer a variety of treatment services to meet the diverse needs of confined offenders, such as substance abuse, anger management, education, and employment readiness. The number of clients that they can accommodate varies across facilities and half of them (10 of 20) serve male offenders exclusively.

Ohio HWHs are another form of community-based residential facility that was established to serve adult offenders. Compared to CBCFs, HWHs serve a wider array of offenders, including parolees, those on post release control, offenders released from prison on transitional control status, and probationers. In terms of organizational structure, HWHs are staff-secure facilities, and one third of them (16 of 43) serve female offenders. Similar to CBCFs, HWHs provide diverse treatment programs to assist offenders' successful reentry process, including sex offender treatment programs, family issues, and mental wellness. Table 5 provides a summary of program-level measures.

Table 5. Program-Level Variables and Coding Scheme

Measures	Category	Coding
Leadership Categories	Low Moderate High	0 1 2
Staff Characteristics Categories	Low Moderate High	0 1 2
Assessment Categories	Low Moderate High	0 1 2
Treatment Categories	Low Moderate High	0 1 2
Evaluation Categories	Low Moderate High	0 1 2
Full Categories	Low Moderate High	0 1 2
Program Setting	CBCF HWH	0 1

### Multilevel Analysis

This section described a series of statistical steps used to administer multi-level analysis. The first research question (Level-1 model) focused on testing whether treatment completion had a significant impact on recidivism while holding other factors (i.e., race, gender, and risk level) constant. The level-1 model therefore could be written as follows:



$$\eta_{ij}^{19} = \log \left[ \frac{\pi_{ij}}{1-\pi_{ij}} \right] = \beta_{0j} + \beta_{1j} PC_{ij}^{20} + \beta_{2j} RACE_{ij} + \beta_{3j} SEX_{ij} + \beta_{4j} RISK_{ij}^{21}$$

Specifically, the expected probability that individual  $i$  in facility  $j$  is convicted for a new felony crime can be expressed as  $E(Y_{ij}) = \pi_{ij}$ , where  $\pi_{ij}$  is the probability that  $Y_{ij} = 1$  and  $1 - \pi_{ij}$  is the probability of not being convicted ( $Y_{ij} = 0$ ). For binary outcome, binominal probability distribution and logit link function were used.

The Level-2 model had only a random intercept and no corresponding facility level error terms were defined for them.

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\vdots$$

Therefore, results in the combined program-level model with 4 fixed effects and one random effect ( $u_{0j}$ ) were:

$$\eta_{ij} = \gamma_{00} + \gamma_{10} PC_{ij} + \gamma_{20} Race_{ij} \dots + u_{0j}$$

As a second step, it was examined whether a level-1 *program completion slope* varied across facilities (i.e., whether the relationship between the program completion and likelihood to get convicted for a new felony crime varied across facilities). In order to explore whether the slope varied, it was necessary to change the Level-2 program completion slope from fixed to randomly varying:

$$\beta_{1j} = \gamma_{10} + u_{1j}$$

Accordingly, the combined program-level model changed from the one presented above due to the presence of the random slope coefficient for program completion ( $u_{1j}$ ) at Level-2. Through substitution, the combined, single equation model was as follows:

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<sup>19</sup> The estimated value of the population proportion

<sup>20</sup>Program Completion (PC)

<sup>21</sup>Risk Level (RISK)

$$\eta_{ij} = \gamma_{00} + \gamma_{10}PC_{ij} + \gamma_{20}Race_{ij} \dots + u_{1j}PC_{ij} + u_{0j}$$

The third step was adding the level-2 predictor (CPC LEVEL) to explain variability in intercepts. The level-2 intercept model was as follows:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}CPC\ LEVEL + u_{0j}$$

When substituting the Level-1 and Level-2 equations into one combined model (adding the Level-2 predictor), the following one-equation model can be created:

$$\eta_{ij} = \gamma_{00} + \gamma_{01}CPC\ LEVEL + \gamma_{10}PCS_{ij} + \gamma_{20}RACE_{ij} \dots + u_{0j}$$

The final step was to examine the existence of cross level interaction between program completion and program integrity. The slope model was as follows:

$$\beta_{1j} = \gamma_{10} + \gamma_{11}CPC\ LEVEL_{ij} + u_{1j}$$

Through substitution, Level-2 predictor that explained Level-1 relationships appeared in the combined model as cross-level interactions. A cross level interaction tested whether a variable measured at a higher level of the data (i.e., program integrity) moderated a relationship (i.e., program completion and recidivism association) observed at a lower level of the hierarchy. The combined model for cross-level interaction was therefore presented as follows:

$$\eta_{ij} = \gamma_{00} + \gamma_{01}CPC\ LEVEL_{ij} + \gamma_{11}PCS_{ij} * CPC\ LEVEL_j \dots + u_{0j}$$

## Conclusions

Chapter 3 provided a detailed description of the dataset that was used in current dissertation research. Specifically, a full description of the individual level measure, program level measures, and outcome measure—re-conviction for a new felony offense—were provided. Finally, the conceptual framework of the multilevel modeling was described. In terms of research hypothesis, Level-1 model was designed to test whether the completion

of residential programs have a significant effect on recidivism. The Level-2 model was created to examine whether or not a program's integrity was associated significantly with recidivism. Lastly and most importantly, an interaction model was built to investigate whether the effect of program completion on recidivism differs based on the degree of program integrity. The next chapter will present the statistical results generated from the methods of analysis described above.

## **CHAPTER FOUR**

### **Introduction**

The main research question analyzed in this study was how treatment completion and integrity interacted to alter the likelihood of re-conviction among offenders in community-based residential programs. In order to address this question thoroughly, three continuative statistical analyses were conducted, which examined the following research questions: 1) were those who completed programs less likely to be convicted of a felony offense than those who did not? 2) Were programs with a higher level of integrity more effective in reducing recidivism, and 3) Was the effect of program completion on subsequent criminal behavior moderated by the level of program integrity? The next sections provide outcomes from the statistical analyses designed to test these three research hypotheses.

### **Descriptive Analyses**

A total of four individual offender characteristics were used as Level-1 predictors of re-conviction, including two demographic variables (gender and race/ethnicity), risk level for recidivism, and treatment completion. Table 6 summarizes the descriptive statistics for these individual-level characteristics and the corresponding percentage of total cases, HWH cases, and CBCF cases for each variable.

More than half of the sample was Caucasian, while the remaining 40% was identified as “Non-Caucasian.” With respect to the gender of program participants, the majority of participants was male, while less than one third were female. Approximately one-fourth of the sample consisted of high-risk offenders, and less than 10% were evaluated as belonging to the low risk group. The medium risk group, on the other hand, represented 68% of the sample. Individuals who completed programs accounted for 65% of the total cases (N=10,072).

Compared to HWH cases, CBCF cases included a higher percentage of Caucasians (50% vs. 67%), females (11% vs. 18%), low-risk offenders (8% vs. 10%), and individuals who completed programs (53% vs. 78%). Although minor differences were found, in general, the two groups (CBCFs and HWHs) appeared to be quite similar in terms of demographic traits and potential risk levels for recidivism.

Table 6. Descriptive Statistics for Individual Characteristics

Measures	Category	% Sample (N=10,072)	% HWH (n=6,070)	% CBCF (n=4,191)
Race	Caucasian	57	50	67
	Non-Caucasian	43	50	33
Gender	Female	14	11	18
	Male	87	88	82
Risk Level	Low	9	10	8
	Medium	68	66	70
	High	23	24	22
Program Completion	No	35	47	22
	Yes	65	53	78

Table 7 summarizes the descriptive statistics for program characteristics and the corresponding percentage of total cases, HWH cases, and CBCF cases for each program-level variable. With respect to overall program integrity, 38% of participants were placed in low integrity programs, while approximately half were assigned to moderate integrity programs. Only 10% of offenders were exposed to high integrity programs.

HWHs tended to adhere more closely to the principles of effective correctional practice than did CBCFs; on three sub-categories and categories, HWHs outperformed CBCFs and had a higher proportion of high quality groups, suggesting that, in general, HWHs have better plans for implementation, and provide higher quality treatment services

than do CBCFs. In terms of variation in the measures, no significant variation was found among the five CPC items with the exception of assessment categories.

Table 7. Descriptive Statistics for Program Characteristics

Measures	Category	% Sample (N=64)	% HWH (n=44)	% CBCF (n=20)
Leadership Categories <sup>22</sup>	Low	20	17	23
	Moderate	64	67	61
	High	16	16	16
Staff Characteristics Categories <sup>23</sup>	Low	15	8	24
	Moderate	73	72	74
	High	12	20	3
Assessment Categories <sup>24</sup>	Low	18	24	10
	Moderate	53	41	70
	High	29	35	20
Treatment Categories <sup>25</sup>	Low	38	37	41
	Moderate	30	27	33
	High	32	36	26
Evaluation Categories <sup>26</sup>	Low	56	56	56
	Moderate	27	28	25
	High	17	16	19
Full Categories <sup>27</sup>	Low	38	24	58
	Moderate	52	61	39
	High	10	15	3

<sup>22</sup> The SDs of Leadership categories for total sample, HWH cases, and CBCF cases were 0.59, 0.57, and 0.61.

<sup>23</sup> 0.52, 0.51, and 0.48, respectively.

<sup>24</sup> 0.68, 0.76, and 0.54, respectively.

<sup>25</sup> 0.83, 0.85, and 0.80, respectively.

<sup>26</sup> 0.76, 0.75, and 0.78, respectively.

<sup>27</sup> 0.63, 0.61, and 0.58, respectively.

### **Inferential Analyses with Hierarchical Linear Modeling**

Since predictors existed in all two levels (i.e., individual characteristics at Level-1 and program integrity at Level-2) and multiple program participants were nested in each facility (N= 64), multilevel analysis was selected as an appropriate statistical tool. Specifically, it was expected that the flexibility of multilevel modeling would accommodate both individual and program-level predictors of recidivism, while correcting adequately for the non-independence of observations nested within facilities (Raudenbush & Bryk, 2001).

The analysis began by building a *null model*. The null model is the simplest random effect model, and is also called the unconditional means. The purpose of running this model was to assess within-group homogeneity and between-group heterogeneity. The subsequent steps included determining the appropriate *fixed-effects components* and the *random-effects components* of the model. The fixed components of the model were determined by adding relevant covariates at both individual and program levels to explain the between- and within-group variability, respectively. The random components of the model were determined by checking which level-1 predictors had random slopes (e.g., researchers specify level-1 predictors as random slopes and then check their variance components to determine whether they should be fixed or not).

#### **Unconditional Random Intercept Model and ICC**

First, the hierarchical linear modeling analysis began with the unconditional model, which is used to determine the necessity of building a multilevel analysis (Johnson, 2010). The unconditional model is often referred to as the null model, as it does not include any predictors in order to produce a predicted value for the mean that is not conditional on any covariates. The null model with only a nesting variable included two components, one fixed effect (the mean post-program probability of re-conviction) and one random effect (the randomly varying intercept).

The tests of covariance parameters in the unconditional model indicated that the estimated variance of the random intercept on the *logit* scale ( $\sigma_{u0}^2 = 0.23$ ) was statistically significant ( $\chi^2 = 155.50, p < 0.001$ ). The between-group variation in the multilevel *logit* model was also used to estimate the Intra-class Correlation Coefficient (ICC), which is an indicator of between-group heterogeneity (i.e., difference in recidivism rates across residential facilities). The estimated ICC represents the proportion of program-level variance in the total variance. For the logistic regression model, the residual variance is equal to  $\pi^2/3$ , thus,  $ICC = \frac{\sigma_{u0}^2}{\sigma_{u0}^2 + \pi^2/3} = \frac{0.23}{0.23 + 3.289} = 0.07$ . This indicates that approximately 7% of the variability in re-conviction lies between residential correctional facilities and therefore, the multilevel modeling approach should be applied to these data (Hedeker, 2007; Johnson, 2010).

Estimates of the fixed effects also were calculated for the null model. For this model, there was only one fixed effect ( $\gamma_{00} = -0.97, p < 0.001$ ), indicating that the overall mean of the log-odds of felony re-conviction was -0.97. The corresponding probability of felony re-conviction in the population on average was ( $p = \frac{\exp(-0.97)}{1 + \exp(-0.97)} = 0.30$ ), suggesting that program participants within the average residential facility tended to have about 30 percent of recidivism rate.

### **Random Intercept Model with Macro Explanatory Variables**

The null model with random intercept-only was a necessary first step in the development of the multilevel model, and the results showed that there was significant between-program variation in the mean rate of felony conviction ( $\sigma_{u0}^2 = 0.23, p < 0.001$ ). Thus, there existed significant unexplained variation in the mean outcome (felony conviction) across residential facilities. As such, the contextual variables or program-level variables that explained the between-program variation were examined in the next step of model development.



When the two contextual variables, *treatment integrity* ( $\beta=-0.24, p <0.05$ ), and *program setting* ( $\beta=-0.05, p = 0.73$ ) were tested, only treatment integrity had a significant effect on between-group variation in felony conviction. Thus, only treatment integrity was included in the model to explain this variation. The outcomes of the *random intercept model with program level explanatory variables only* showed that the model converged after just seven iterations, indicating an appropriate model fit. Among the two fixed effects, the estimated overall mean outcome (felony conviction) corresponding to low treatment integrity (i.e., treatment integrity = 0) was  $\gamma_{00} = -0.53$  ( $p <0.01$ ), and the main effect of treatment integrity was  $\gamma_{01} = -0.25$  ( $p <0.01$ ), suggesting that the felony conviction rates in medium quality treatment programs ( $\gamma_{00} + \gamma_{01} = -0.53 + (-0.25)*1 = -0.78$ ) and high quality treatment programs ( $\gamma_{00} + \gamma_{01} = -0.53 + (-0.25)*2 = -1.08$ ) were significantly lower than in the low quality treatment programs ( $\gamma_{00} = -0.53$ ).

After including covariates in the model, the ICC is referred to as the *conditional ICC* (Garson, 2012), which is a measure of the degree of between-group heterogeneity after controlling for the contextual variable (treatment integrity). The conditional ICC calculated was 0.06 ( $ICC = \frac{\sigma_{u0}^2}{\sigma_{u0}^2 + \pi^2/3} = \frac{0.21}{0.21 + 3.289} = 0.06$ ), suggesting that approximately 6% of the within-group homogeneity was explained by treatment integrity. The proportion of between-group variation in felony conviction explained was also estimated using Raudenbush and Bryk's method (2001), and was equal to 0.09 ( $1 - \frac{0.21}{0.23} = 0.09$ ), indicating that approximately 9% of the variation in recidivism was explained by treatment integrity. This estimate showed that there was a small decline in the residual variance component when compared to the unconditional model.

### Random Intercept Model with Micro Explanatory Variables

The results of the *random intercept model with program-level predictors only* in the previous section showed clearly that treatment integrity did explain the variation among group mean outcomes without considering for the characteristics of program participants (i.e., gender, ethnicity, and risk level). In this section, a random effect model with level-1 predictors was addressed. Four individual-level measures, *gender*, *ethnicity*, *risk level*, and *program completion status* were included in the model along with the program-level measure, *treatment integrity*, in order to predict variation in the level-1 random intercept coefficients,  $\beta_{0j}$ .

All four level-1 explanatory variables (*gender*, *ethnicity*, *risk level*, and *program completion*) had significant effects on recidivism. Specifically, when treatment integrity was controlled, male ( $\beta = 1.05, p < 0.01$ ), Non-Caucasian ( $\beta = 0.26, p < 0.01$ ), higher risk ( $\beta = 1.03, p < 0.01$ ) offenders were more likely, on average, to be convicted of a felony crime compared to their counterparts (female, white, and lower risk offenders, respectively).

The analysis also tested whether or not those who completed programs performed better than those who did not. Program completion was negatively predictive of re-conviction ( $\beta = -0.67, p < 0.01$ ), indicating that those who completed programs tended to be less likely to commit a crime after receiving treatment by comparison to program dropouts. The odds ratio of 0.51 (odds ratio =  $1/0.51 = 1.96$ ) for program completion suggested that the likelihood of re-conviction for those who did not complete their programs was 1.96 times higher than that for those who did.

The regression coefficients for moderate ( $\beta = -0.24, p < 0.01$ ) and high integrity ( $\beta = -0.57, p < 0.01$ ) programs showed a negative association between treatment integrity and recidivism, which was consistent with prior studies as well as theoretical expectations. Thus, the participants in correctional services that adhered more closely to the principles of

effective treatment program had a lower likelihood of recidivism. According to the odds ratio for program integrity, the predicted odds of recidivism for low integrity programs were 1.26 (odds ratio=1/0.79=1.26) times the odds for moderate integrity programs and the predicted odds of reconviction for low integrity programs were 1.72 (odds ratio= 1/0.58=1.72) times the odds for high integrity programs.

Finally, this model was compared to the contextual model to assess any improvement in the model fit by adding level-1 predictors. The deviance statistics employed for model comparison showed that adding the four level-1 explanatory variables (gender, ethnicity, risk level, and program completion) reduced -2LL from 12,161.41 to 11,416.68 ( $\chi^2=16.92$ ,  $p < 0.05$ ), thus indicating an improvement in model fit.

### **Testing Level-1 Predictors**

In the previous section, the analysis was conducted with an emphasis on the variation in the mean outcome across residential facilities, and how this variation was explained by macro (individual characteristics of program participants), and micro explanatory variables (treatment integrity). The next step tested whether the effects of level-1 predictors on recidivism varied across programs. The results of this test can help identify correctly the level-1 predictors in the final model that should be specified as fixed, and those that should be random (i.e., if program completion or gender of participants have a different level of impact on recidivism between residential facilities).

The preliminary results of the randomness of level-1 slope indicated that, in addition to the level-1 intercept, the slope coefficient of the variable “*program completion*” varied significantly across residential programs ( $z=1.76$ ,  $p < 0.05$ ). Therefore, in the final interaction model, the effects of all level-1 explanatory variables except program completion (i.e., gender, ethnicity, and risk level) on the outcome measure *re-conviction* were fixed. The

final model became a mixed model with a random level-1 intercept, one level-1 random slope, and three fixed level-1 slopes.

### **Cross-Level Interaction Model**

The model specified in the previous section tested the main effects of the level 1 and 2 explanatory variables. In this section, the cross-level interaction, which tested whether the influence of program completion on recidivism was moderated by treatment integrity, was examined. The results of the model showed that the interaction between treatment integrity and program completion was not statistically significant; neither the cross-level interaction term for moderate nor high integrity was statistically significant ( $\beta = -0.21, p > 0.05$ ;  $\beta = -0.22, p > 0.05$ ). The effect of variable *program completion* on the outcome measure, therefore, did not depend upon the values of the program-level variable *treatment integrity*, demonstrating that the difference in felony re-conviction between those who completed their programs and those who dropped out were not significantly different, regardless of whether they were assigned to low, moderate, or high quality residential treatment programs. Table 8 displays the summary of the multilevel logistic regression model with re-conviction as the dependent variable.

In order to identify the specific aspects of program integrity that were associated significantly with recidivism, five sub-criteria of the CPC were included in the multilevel model. Table 7 shows the results from the analysis with five program characteristics. The regression coefficients in the contextual model suggested that only *treatment characteristics* was a significant predictor of recidivism ( $\beta = -0.25, p < 0.01$ ). This suggested that, between facilities, the degree to which more clinically relevant correctional treatments were provided was related negatively to the probability of being convicted of a new crime. The variation in the structure or management system across facilities (e.g., leadership of program director or staff characteristics) did not explain recidivism significantly.

With respect to cross-level interactions that estimated whether or not the two variables exerted a joint effect on the outcome beyond the main effects of each variable individually, the interaction coefficients for the combination of moderate integrity and program completion ( $\beta = 0.15, p > 0.05$ ), and the combination of high integrity and program completion ( $\beta = 0.05, p > 0.05$ ) were not significant, suggesting that treatment quality was unrelated to the degree of association between program completion and the likelihood of being convicted of a new offense. Table 9 represents the summary of the multilevel logistic regression model with CPC sub-categories.

Table 8. Summary of Multilevel Regressions of Variables on Recidivism (Re-conviction).

Parameter	Unconditional Model		Contextual Model		Interaction Model	
	b	Exp (b)	b	Exp (b)	b	Exp (b)
Intercept	-2.22**	0.11	-2.00**	0.13	-2.01**	0.13
Male			1.05**	2.86	1.05**	2.87
Non-White			0.26**	1.30	0.26**	1.30
Risk Level (Moderate)			0.56**	1.75	0.55**	1.74
Risk Level (High)			1.03**	2.80	1.02**	2.79
Program Completion			-0.67**	0.51	-0.63**	0.49
Treatment Integrity (Moderate)			-0.24**	0.79	-0.27	0.77
Treatment Integrity (High)			-0.57**	0.58	-0.46*	0.63
Moderate Integrity × Program Completion					0.21	1.02
High Integrity × Program Completion					-0.22	0.81
Level-1 Variance	0.06		0.03		0.02	
Intercept Variance	0.10**		0.08**		0.08**	
Deviance (# of RSPL parameters)	45623.70 (2)		45640.83 (2)		45658.52 (2)	

<sup>+</sup> $p < 0.10$ , \* $p < 0.05$ , \*\* $p < 0.01$

Table 9. Summary of Multilevel Regressions with CPC Sub-Categories

Parameter	Individual Model		Contextual Model		Interaction Model	
	b	Exp (b)	b	Exp (b)	b	Exp (b)
Intercept	-2.88**	0.56	-2.84**	0.58	-2.81**	0.06
Male	1.08**	2.95	1.05**	2.88	1.06	2.87
Non-White	0.26**	1.29	0.26**	1.30	0.26**	1.30
Risk Level (Moderate)	1.03**	2.79	0.55**	1.74	0.56**	1.74
Risk Level (High)	0.56**	1.75	1.02**	2.79	1.03**	2.79
Program Completion	-0.67**	0.51	-0.65**	0.53	-0.59**	0.58
Program Leadership (Moderate)			0.12	1.13	0.12	1.13
Program Leadership (High)			0.10	1.11	0.11	1.12
Staff Characteristic (Moderate)			-0.03	0.98	-0.03	0.94
Staff Characteristic (High)			-0.05	0.95	-0.06	0.98
Risk Assessment (Moderate)			0.27	1.31	0.27	1.31
Risk Assessment (High)			0.14	1.15	0.14	1.16
Treatment Characteristic (Moderate)			-0.25**	0.78	-0.27	0.76
Treatment Characteristic (High)			-0.45 <sup>+</sup>	0.63	-0.52	0.60
Quality Assurance (Moderate)			-0.11	0.89	-0.11	0.90
Quality Assurance (High)			-0.09	0.91	-0.09	0.91
Moderate Integrity × Program Completion					0.15	1.05
High Integrity × Program Completion					0.05	1.16
Level-1 Variance	0.05		0.02		0.02	
Intercept Variance	0.09**		0.07**		0.06**	
Deviance (# of RSPL parameters)	45647.70 (2)		45650.61 (2)		45658.49 (2)	

<sup>+</sup>*p* < 0.10, \**p* < 0.05, \*\**p* < 0.01

### **Additional Multilevel Logistic Regression Analysis by Program Setting**

Though the debate continues as to the ideal therapeutic conditions of correctional intervention, numerous studies consistently reported that treatments in a community setting work better than do those in an institution (Losel, 1993). Multiple meta-analyses, for example, have proven that custodial institutions had smaller effect sizes than those implemented in private, informal settings (Andrews et al., 1990; Izzo & Ross, 1990; Lipsey, 1992; Whitehead & Lab, 1989). With a few exceptions (Antonowich & Ross, 1994), a large body of literature has revealed significant differences between community and institutional contexts, and demonstrated that offenders performed better when they receive treatment service in real world settings where they have more opportunities to interact with law-abiding citizens and engage meaningfully in their communities.

To explore the genuine effect of different program settings on recidivism, current research used data collected from two distinctive types of community-based residential programs: Community-Based Correctional Facilities (CBCFs) and Halfway Houses (HWHs). CBCFs are secure, locked facilities that serve felony offenders sentenced by judges for a period between 4 and 6 months. HWHs are non-custodial facilities that accommodate a wider array of adult offenders than do CBCFs (i.e., offender released from state prisons, referred from the court, or sanctioned due to violation of community supervision).

Both programs provide a variety of treatment services to help offenders' reenter society successfully. Because both programs serve offenders who are assigned to one of the community-based correctional programs, it was expected that the preexisting differences between target groups would be minimal (i.e., prior studies compared institutional samples and community samples directly); thus, more accurate measures of the contextual effects on recidivism could be performed.



Given the prior research, it is plausible that treatment programs work better in non-secure settings than in secure settings (Losel, 1993). In order to test this theory, the two-level logistic regression model was extended to a three-level model to explore whether the difference in program setting (i.e., CBCFs vs. HWHs) altered the probability of re-conviction. The intercept coefficient for the Level-3 model was, however, not statistically significant ( $t = 0.02$ ,  $p = 0.75$ ), thus suggesting that the variability in recidivism cannot be explained by program context.

Although program setting was not found to be a significant contextual predictor of recidivism at both two-level and three-level logistic regression analyses, the two separate multilevel analyses for each program context (CBCFs vs. HWHs) were conducted to obtain a more clear picture on the nature of relationship between program setting and treatment effectiveness.

The results showed that the strength of the relationship between program completion and recidivism was stronger among HWH than CBCF cases, when program integrity was held constant. Specifically, the odds ratio of program attrition in contextual model was 1.79 for HWH cases while the odds ratio for program attrition in contextual model was 1.16 for CBCF cases.

The separate multilevel models (CBCFs vs. HWHs) also suggested that program context may not affect the association between treatment integrity and program completion. The results from HWH model were consistent with the total case model; *program completion* at individual model and *program integrity* at contextual model were both statistically significant, and yet there was no significant cross-level interaction between these two variables. The outcomes generated from CBCF model also showed a similar pattern. In summary, both *program completion* and *higher quality of correctional services* were effective in improving the offenders' performance after receiving treatment, but there was no

considerable difference between the effect of program completion in high and low integrity programs.

Table 10. Multilevel Logistic Regression Analysis with HWH Cases

Parameter	Individual Model		Contextual Model		Interaction Model	
	b	Exp(b)	b	Exp(b)	b	Exp(b)
Intercept	-2.16**	0.12	-2.09**	0.12	-2.22**	0.11
Male	0.80**	2.23	0.82**	2.26	0.81**	2.24
Non-White	0.29**	1.33	0.29**	1.33	0.29**	1.34
Risk Level (Moderate)	0.56**	1.75	0.55**	1.74	0.55**	1.74
Risk Level (High)	1.04**	2.84	1.05**	2.85	1.04**	2.84
Program Completion	-0.57**	0.57	-0.56**	0.56	-0.29*	0.75
Treatment Integrity (Moderate)			-0.05	0.95	-0.13	1.15
Treatment Integrity (High)			-0.37*	0.68	-0.14	0.87
Moderate Integrity × Program Completion					-0.38	0.68
High Integrity × Program Completion					-0.51	0.59
Level-1 Variance	0.08		0.06		0.06	
Intercept Variance	0.12**		0.11**		0.11**	
Deviance	36623.40 (2)		36649.20 (2)		36654.70 (2)	
(# of RSPL parameters)						

+  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$

Table 11. Multilevel Logistic Regression Analysis with CBCF Cases

Parameter	Individual Model		Contextual Model		Interaction Model	
	b	Exp(b)	b	Exp(b)	b	Exp(b)
Intercept	-2.00**	0.14	-1.81**	0.16	-1.71**	0.18
Male	1.30**	3.65	1.29**	3.63	1.30**	3.68
Non-White	0.23*	1.26	0.23*	1.26	0.23*	1.26
Risk Level (Moderate)	0.55**	1.72	0.53**	1.71	0.54**	1.71
Risk Level (High)	0.96**	2.62	0.96**	2.61	0.96**	2.62
Program Completion	-0.86**	0.42	-0.86**	0.42	-1.02**	0.36
Treatment Integrity (Moderate)			-0.38**	0.67	-0.70**	0.49
Treatment Integrity (High)			-0.14	0.86	0.07	1.07
Moderate Integrity × Program Completion					0.44	1.56
High Integrity × Program Completion					-0.56	0.57
Level-1 Variance	0.05		0.03		0.02	
Intercept Variance	0.10**		0.07**		0.06**	
Deviance	26823.80 (2)		26843.10 (2)		26851.60 (2)	
(# of RSPL parameters)						

<sup>+</sup>  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$

## Conclusions

In summary, treatment integrity and program completion were found to have significant, yet separate effects on recidivism; the non-significant cross-level interaction between program integrity and completion suggested that it might be unnecessary to consider this association in explaining variations in recidivism across facilities. The results of the multilevel logistic regression model also indicated that program completion alone predicted a reduced probability of recidivism for individuals in the criminal justice community. Although the degree of treatment integrity was found to be related significantly to a considerable reduction in re-conviction, only *treatment characteristics* was revealed to be an important predictor of subsequent criminal activities among five-sub-categories of CPC, thus partially supporting a theory of effective correctional interventions.

## **CHAPTER FIVE**

### **Introduction**

The primary goal of rehabilitative correctional interventions is to address certain characteristics of offenders that have been demonstrated empirically to affect their subsequent involvement in criminal activities. The literature has demonstrated that in order to reduce recidivism effectively, correctional services must be designed strictly in accord with relevant research findings and implemented as planned; if some programs do not produce desirable outcomes, it is assumed that they either are not evidence-based interventions, or they do not have any specific, adequate plans for program implementation.

Numerous correctional studies have also shown that it is essential for offenders to complete a program successfully in order to benefit fully from the given treatment services. As such, program completion has often been used as a preliminary measure of success of the intervention under review, given the strong connection that has been found between program completion and reduced rates of recidivism in many studies. The question that has been raised by correctional scholars recently is: if the program was not based on empirical findings or was not implemented properly, does program completion still matter? Also how does such connection affect program completion?

This dissertation research was designed to answer this research question using data from 2010 Ohio community-based correctional intervention studies. Specifically, data were collected from over 10,000 offenders who were placed in one of 64 community-based correctional facilities in Ohio between 2006 and 2007. Program participants were assigned to either community-based correctional facility (CBCF) programs or halfway house (HWH) programs. Recidivism was defined as a new conviction for a felony offense and two years of follow-up was used. Treatment integrity was measured with the correctional program checklist (CPC), an assessment tool validated in diverse correctional settings.

A series of multi-level logistic regression analyses was conducted to determine whether or not treatment integrity and program completion had significant effects on reducing recidivism, whether any particular component of program integrity was associated more closely with subsequent criminal behaviors, and whether the influence of program completion was moderated by different levels of treatment integrity. This final chapter is designed to summarize the results of these multilevel modeling analyses, and to provide a discussion of the limitations of the research, as well as the implications for correctional policies and future research.

### **Summary of Findings**

The findings below are summarized for each research question. A total of three research questions were asked:

- 1) Does the completion of a residential correctional program for adult offenders have a significant effect on recidivism?
- 2) Is program integrity associated significantly with reductions in recidivism among program participants?
- 3) Does the effect on recidivism of program completion differ according to the degree of program integrity?

With respect to the first research question, the influence of program completion on recidivism was tested in a multilevel regression model with the entire sample. Based on prior research on program attrition, it was expected that offenders who did not complete the program would be more likely to be convicted of a new felony offense than would offenders who successfully completed a program. The results indicated that program completion did have a significant effect in reducing recidivism, which was consistent with findings from previous studies (McMorran, Huband, & Overton, 2010). Specifically, the probability of a

new conviction for those who did complete a program was 56 % lower than was the probability of a new conviction for those who did not.

The multilevel model was also used to examine the effect of program integrity on recidivism. Based on prior research, it was expected that programs that followed the principles of a successful correctional intervention were likely to have lower rates of recidivism. The results indicated that program integrity was associated negatively with the probability of recidivism. Specifically, the predicted odds for low integrity programs were 1.28 times greater than the odds for moderate integrity programs and were 1.72 times higher than were those for high integrity programs, suggesting that increases in the levels of program integrity decreased the likelihood of re-conviction.

Next, among the five sub-criteria of the CPC (i.e., identifying criminogenic needs and high risk groups, considering the qualifications of the program director and staff, providing clinically relevant treatments, and evaluating the overall performance of the program), only *treatment characteristics*, which measured whether or not the program under review delivered cognitive behavioral services that focus properly on relevant criminogenic needs, were found to be a predictive factor in recidivism. Variations in the structure or management system of the correctional interventions were not significant in explaining recidivism.

Finally, the influence of program completion on recidivism was examined while considering the levels of program integrity. It was expected that the significance and strength of the program completion-recidivism association might depend on levels of program integrity; if the program did not adhere properly to the principles of effective correctional practice, program completion would either have no or minimal influence on recidivism; however, if the program adhered adequately to the principles of effective correctional practice, program completion would reduce recidivism significantly.

The results of multilevel analyses, however, implied that association between program completion and recidivism was not influenced by the level of program integrity. That is, the effect of program completion on recidivism did not differ depending on the levels of program integrity; even if the program did not follow the principles of effective treatment sufficiently, program completion was still an important element that predicted a significant decrease in the probability of recidivism.

Additionally, two multilevel analyses were conducted separately to control the possible influence of program setting: a model of HWH cases alone versus. a model of CBCF cases alone. Based on prior research, it was expected that treatment programs would work better in non-secured setting (HWHs) than in secured setting (CBCFs). As a result, program completion was found to have a greater influence on recidivism for HWH cases than CBCF cases. Those in HWHs who did not complete a program were 1.75 times more likely to recidivate than their counterparts in HWHs who did, while those in CBCFs who failed to complete a program were 1.16 times more likely to recidivate than their counterparts who did, when controlling for individual characteristics of program participants (i.e., race, gender, and risk level) and program integrity. Although the three-level regression model did not support the theory of program context, this result indicates a possible connection between program completion effects and program setting, in that program completion reduced recidivism effectively and its favorable effect can be amplified when the program is implemented in a non-secured community setting.

### **Limitations**

This study provides beneficial information pertaining to the treatment conditions that may maximize the positive effects of residential programs for adult offenders. Despite the significance of this study, there were several limitations to the research that should be addressed. These include a methodological weakness, small sample sizes in the multilevel



models, weak external validity of the findings, and limited ability to interpret the influence of program settings.

One of the most significant problems faced in this study was the methodological weakness in key factors. For example, *program completion* needed to be measured with a more sophisticated coding scheme to estimate its effect on recidivism accurately. Indeed, program participants drop out for different reasons at different stages of the treatment. For example, at least three different types of program dropouts exist conceptually, including participants who fail to return, those who refuse to return, and those who are expelled from a treatment program for various reasons (i.e., lack of cooperation, poor response to treatment, etc.). The literature that classified those who did not complete their programs depending on the time at which dropout occurred demonstrated that different periods of participation in a treatment program had a significant effect on recidivism (Baekeland & Lundwell, 2012).

Furthermore, the outcome measure—re-conviction for felony offense—is subject to known limitations in official crime data. Specifically, the estimate of program effectiveness can be influenced by the type of recidivism measure used. Some literature has suggested that studies that measured recidivism in terms of convictions tended to produce larger estimates of treatment effectiveness relative to studies that used other types of measures of recidivism, such as arrest, probation, and incarceration (Welsh & Farrington, 2007). Hence, a causal explanation is required when interpreting the findings of this study, and it is advisable that future researchers use multiple indicators (i.e., the proportion of offenders who are crime-free during a specified follow-up period, the severity of crimes committed after intervention, and the time to next criminal activity) to assess program effectiveness more accurately.

Next, according to the statistical literature, the sample size at each level of a multilevel analysis plays a significant role in estimating parameters (Bell, Morgan, Kromre & Ferron, 2010). Although an adequate sample is essential in every quantitative research, it is

more critical in multilevel models due to their complex nature in equations. Among various sample size guidelines in the literature, one suggestion for designs in which individuals are nested within groups calls for a minimum of 60 units at each level of analysis. This recommendation has been tested and validated in several studies (Hox, 1998; Mass & Hox, 2002, 2004).

Although this research attempted to adhere to these guidelines by incorporating data from 64-community-based facilities into the causal equation, the nature of correctional treatment data, which do not allow random sampling, made these recommendations difficult to achieve. For example, the dispersal of offenders across facilities was less than ideal. Offenders were dispersed among a large number of Level-2 units (facilities) in which there were few individuals per group. For example, the data for this study provided observations on approximately 36% of offenders ( $n=3,370$ ) nested in only 10 facilities. The literature has shown that such imbalanced cluster sample sizes may cause several problems, including positive bias in the intercept and slope variance estimates (Hox, 1998).

The other limitation involved with the current research is the limited ability to generalize the findings. Maxwell (2005) distinguished between internal and external generalizability. Internal generalizability refers to the generalizability of a conclusion within the group examined, while external generalizability refers to its generalizability beyond that setting. Given that this study took place at 64 sites in Ohio, it appears to have a relatively high internal generalizability when compared to prior research that has only focused on a single site. Achieving external generalizability is another essential elements for quantitative research, and this study had limited external generalizability owing to a lack of diversity in the location of the programs (i.e., data included community-based residential programs operated only in Ohio) and sample (i.e., all facilities accommodated only adult offenders).

For example, an analysis conducted with a similar research design might produce

different results with a sample of juvenile offenders. Given that data were collected from either community-based correctional facilities (CBCFs) or halfway houses (HWHs), other types of community-based correctional interventions, such as day treatments or community supervision programs, may produce quite different outcomes.

Lastly, the results of multilevel analyses that suggested a possible connection between program completion and intervention context should be interpreted cautiously. Of course, as prior studies have implied, it is plausible that treatment programs implemented in secure institutions are less effective in reducing recidivism because of the difficulty in secured settings of transferring positive learning and pro-social skills to the outside world, together with insufficient opportunities to interact with law-abiding citizens.

However, the different intensity of the relationship between program completion and recidivism could be a function of several other relevant factors in addition to the effect of program context. It is possible that such differences may be the outcome of pre-existing differences in the sample (i.e., a large number of offenders with antisocial personalities in CBCFs). It is also possible that program completion is a more significant predictor of diminished recidivism because the negative effects of institutionalization (i.e., punishment and security) predominate; it is well known that offenders usually receive more treatment in private facility than they do in state facility, because rehabilitative programs under state facility are trimmed occasionally as states' correctional budgets have tightened. Thus, in general, caution is required when interpreting the results pertaining to the influence of program setting on program completion and recidivism association.

## **Implications**

### **Policy Implications**

Despite the limitations above, this research has considerable implications for correctional policy. Community-based correctional programs have been used increasingly

across states as a cost effective alternative to sending offenders to prison. Residential community corrections facilities, in particular, have been recognized as effective intermediate sanctions that offer more intensive supervision than do probation and parole and further assist offenders by keeping them in the community where they can receive more treatment services than they otherwise would in prison. In addition, these facilities are financially more efficient interventions when compared to prison because program participants subsidize a certain portion of the costs by working full time.

Nonetheless, few studies have explored under what conditions residential community corrections facilities produce the most favorable outcomes. The results of the multilevel regression analyses in this study provided a clearer picture of the factors that can maximize the positive effects of residential programs for offenders in a community. Two major factors were found to be strong predictors of the reduced likelihood of involvement in criminal activities after receiving treatment: program participants who successfully completed the given intervention, and close adherence of the treatment programs to the principles of effective correctional practice.

First, the success of program participants in completing the treatment given was linked directly to decreased odds of recidivism. Thus, program completion is still an important factor that reduces the probability of recidivism effectively, even when the program does not follow the principles of effective correctional practices strictly. This finding is consistent with previous research on program attrition. The literature on treatment completion has demonstrated that, although offenders drop out of a program for a variety of reasons (i.e., participants simply fail to show up, or lose funding for service), those who fail to complete are more likely to be high-risk, high-need offenders who would benefit the most from completing the services (Olver, Stockdale, & Wormith, 2011).

Therefore, to maximize the beneficial effects of correctional treatment services, the treatment staff and facilitators should encourage participants to finish their programs actively by paying special attention to high risk/need groups and offering adequate assistance that eliminates any interruptions that may keep an offender from being discharged successfully from the treatment services.

Next, although therapeutic integrity did not moderate the positive program completion effect significantly, it appeared that treatment quality is still important in the effective reduction of recidivism. Prior studies have identified specific characteristics of effective rehabilitative correctional interventions that distinguish them from those that are ineffective by assessing the correlation between levels of program integrity and reductions in recidivism (Latessa, Lovin, & Smith, 2010).

This study demonstrated clearly that the integrity of programs for residential correctional intervention is related directly to recidivism, even after individual risk factors (i.e., race, gender, risk level, and program completion) are controlled statistically; the greater the degree to which a program embodies the principles of effective correctional services, the higher the reductions in recidivism. Therefore, in order to reduce recidivism effectively, community-based correctional interventions must be developed on sound theoretical foundations and, as much as possible, implemented as initially planned.

Lastly, until recently, correctional policymakers and practitioners have cast deep doubt upon the idea that programs can be evaluated objectively (Latessa, 2013). In part, this was due to the prevailing myths among practitioners in the field (i.e., certain types of programs are not suitable for evaluation; evaluation studies are too expensive). However, after numerous studies demonstrated the high validity and reliability of treatment integrity measurements, program evaluations have been executed more frequently and widely across states, resulting in more informed decision making among practitioners, as well as systematic

monitoring systems for program performance (Latessa, 2013). This study once again stresses the necessity of assessing the operation of programs rigorously by presenting supportive evidence for the importance of treatment integrity in reducing recidivism.

### **Implications for Future Research**

This research has provided several valuable pieces of information that may be used to enhance the overall effectiveness of residential community-based interventions for adult offenders. It has also raised a number of important research questions that should be addressed in future studies. First, this study highlighted the practical challenges in defining program integrity. For example, several new criteria were added to the original CPC items to avoid potential lack of variation in the scales. Thus, future researchers should focus on creating more sophisticated measurements of program integrity, which reflect a recent improvement in correctional interventions (i.e., almost every correctional facility now utilizes the risk assessment tool during the admission process).

With respect to the internal consistency of the CPC, although program integrity by itself was found to be a significant predictor of recidivism, a multilevel follow-up analysis with sub-categories of CPC showed that only *treatment characteristics* were linked significantly with reduced recidivism. Notably, *treatment characteristics* also had the greatest influence in reducing recidivism ( $r = 0.55$ ) when compared to the remainder of the program traits in the prior research conducted by Latessa et al. (i.e., Pearson's correlation coefficient  $r$  ranged from 0.16-0.41).

Indeed, the sub-criteria *treatment characteristics* was designed initially to measure whether or not a treatment program reduces criminogenic targets by providing correctional services that have been verified empirically. Conversely, the remainder of the program trait scales (i.e., leadership and development, staff characteristics, and quality assurance) was developed to measure whether or not a program has a well-organized management system

and the ability to deliver the correctional intervention for offenders effectively. Therefore, it is plausible that *treatment characteristics* may influence recidivism directly, while the other four program characteristics may moderate the effects of such an association. A more sophisticated statistical modeling (i.e., structural equation modeling) that is designed to understand the comparative strengths of direct and indirect relationships among these key variables are required to test this hypothesis.

Next, the application of simpler forms of statistical analysis is recommended to understand the true nature of the relationships among treatment integrity, program attrition, and recidivism. As stated earlier, it is quite difficult to satisfy the sample size recommendations for hierarchical linear modeling with correctional intervention data, partially due to the lack of random sampling and the uneven dispersal of program participants across facilities. Performing separate logistic regression analyses for programs with different levels of treatment integrity (i.e., low, moderate, and high-level facilities) would be a good starting point. In this context, prior to a comparative analysis, it is crucial to match samples in each facility with individual characteristics that have been demonstrated to influence program completion in previous studies (e.g., age, risk level for recidivism, size, and location of facility, etc.).

Third, generalization is a critical element of the wider scientific process; however, this research suffered from weak external validity because it focused solely on community-based correctional facilities for adult offenders in Ohio. Future research, therefore, should attempt to expand the diversity in samples in order to improve external generalizability. For example, efforts must be made to collect data on programs that serve other populations, such as females and juvenile offenders, and to expand the samples to other states/regions.

Finally, research must continue on the association between treatment integrity and program attrition, as well as their comprehensive roles in reducing recidivism. These efforts

will benefit not only offenders who may learn valuable pro-social skills through well-designed treatment services, but they will also help legislators and correctional practitioners make informed decisions about what is essential to a program's success, and which aspects of a program require substantial revision to improve their effectiveness overall. Further, by making rigorous evaluation an imperative part of the operation of a correctional treatment program, both enhanced quality of correctional intervention and public safety can be achieved.

Overall, despite the methodological limitations, this study made some noteworthy findings which revealed the ideal treatment conditions necessary to maximize the effectiveness of residential correctional programs in community settings. This study also illustrated the possibility of conducting research on the concept of treatment integrity while taking into account the characteristics of individual program participants. Finally, this dissertation sparked institutional interest in reviewing the specific traits of treatment program that effectively reduced recidivism and such interest is expected to greatly improve the support of program evaluation within and among residential correctional facilities.



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## Appendix A: CPC Items for Five Sub-Categories

### CPC: Program Leadership and Development

Measures	Category
Age <sup>28</sup>	0-15 <sup>29</sup>
	16-29
	30+
Program Director Supervision <sup>30</sup>	<5 hours/month
	5+ hours/month
Coed Scale <sup>31</sup>	-1
	0
	1
Program Director Qualified <sup>32</sup>	No
	Yes
Literature Review <sup>33</sup>	No
	Yes
Stable Funding <sup>34</sup>	No
	Yes
Leadership Categories <sup>35</sup>	0 to 1
	2 to 3
	4 to 5

<sup>28</sup> Programs aged over 30 were coded as 2.

<sup>29</sup> The first category for each item was used as a reference group for statistical analysis.

<sup>30</sup> Program directors that conducted fewer than five hours of structured supervision per month were coded as 0. Structured supervision included regularly attending treatment team meetings and offering feedback on cases being reviewed, etc.

<sup>31</sup> Programs that were not coed were scored as 0; Programs earned a point for treating both males and females, as long as living space was not shared; a point was deducted if the program was coed and living space was shared.

<sup>32</sup> Programs operated by directors that had at least a bachelor's degree in a helping profession were coded as 1.

<sup>33</sup> Programs that conducted a thorough review of the literature when selecting program materials and regularly disseminated current literature on evidence-based practices to program staff were coded as 1.

<sup>34</sup> Programs whose funding was stable were coded as 1.

<sup>35</sup> Leadership categories represent the cumulative effects of meeting multiple items within the Program Leadership and Development domain.

### CPC: Staff Characteristics

Measures	Category
Staff Skill Scale <sup>36</sup>	0
	1 to 3
	4+
Clinical Meeting Scale <sup>37</sup>	0 to 3
	4 to 5
Meeting Training <sup>38</sup>	No
	Yes
Initial Training-Time <sup>39</sup>	Above or Below 60-90 Hours
	60-90 Hours
Initial Training-Treatment Oriented <sup>40</sup>	Above or Below 20-30%
	20-30%
Clinical Supervision by Certified Staff <sup>41</sup>	No
	Yes
Staff Characteristics Categories <sup>42</sup>	0 to 1
	2 to 4
	5 or more

<sup>36</sup> Staff skills scale measured characteristics that programs look for when hiring new staff. Six desired staff characteristics included: 1) assertive/directive; 2) firm but fair; 3) won't get walked on by offenders; 4) problem solving skills; 5) paperwork skills; and 6) computer skills. The staff skills scale is coded so that a point is awarded for each of the six items.

<sup>37</sup> Clinical meeting scale measured the nature of clinical or treatment team meetings held at a facility. A scale was created for this item where a point was awarded for each of the following meeting characteristics: 1) 4 or more meetings held per month; 2) case files reviewed during meetings; 3) meetings attended by the program director; 4) meetings attended by case managers; and 5) meetings attended by security staff.

<sup>38</sup> Meeting Trainings measured whether formal training was incorporated into agency meetings. Programs that offered training in at least one meeting per month were coded as 1.

<sup>39</sup> Initial training—time scale examined initial training efforts by programs. Maximum benefit was obtained from programs that required between 60 and 90 hours of initial training, which includes formal training and on-the-job training. Programs that required either more or less than this amount were coded as 0.

<sup>40</sup> Programs that 20-30 percent of the initial training was treatment-oriented were coded as 1.

<sup>41</sup> Programs that offered clinical supervision by a certified staff person were coded as 1.

<sup>42</sup> Staff categories represent the cumulative effects of meeting multiple items within the Staff domain.

### CPC: Program Level Measures: Assessment Items

Measures	Category
Exclusionary Criteria Scale <sup>43</sup>	1
	2
Exclusionary Criteria Followed <sup>44</sup>	No
	Yes
Client Appropriate <sup>45</sup>	No
	Yes
Risk Assessed <sup>46</sup>	No
	Yes
Specific Need Assessment <sup>47</sup>	No
	Yes
Assessment Training Scale <sup>48</sup>	0 to 1
	2
Copies of Risk Assessment Provided <sup>49</sup>	No
	N/A
	Yes
Responsivity Factor Assessed <sup>50</sup>	0 to 2 Characteristics
	3 or More Characteristics
Validation of Risk Assessment <sup>51</sup>	No
	Yes
Assessment Categories <sup>52</sup>	0 to 4
	5 to 6
	7 or more

<sup>43</sup> Programs received a point for each of the following: 1) NOT excluding high risk offenders; 2) excluding offenders with both a history of arson and a history of serious or repeated violent offenses.

<sup>44</sup> Programs that followed their exclusionary criteria were coded as 1.

<sup>45</sup> Programs that identified that overall participants were appropriate for the services being offered by the program were coded as 1.

<sup>46</sup> Programs that assess those risk factors related to criminal recidivism were coded as 1.

<sup>47</sup> Programs that have incorporated additional specific need assessments(e.g., substance abuse, anger management, or criminal thinking scale), beyond a general risk/need tool (i.e., Level of Service Inventory-Revised) were coded as 1.

<sup>48</sup> It is important to provide staff with both formal training on the risk tool used by the program, as well as additional on-the-job training so that staff could see how the instrument was used and become comfortable using the tool. Programs offering both forms of training experienced were coded as 2.

<sup>49</sup> Programs that used an outside assessor and obtained copies of each offender's risk/need tool were coded as 1.

<sup>50</sup> Programs that included an array of standardized responsivity assessments were coded as 1.

<sup>51</sup> Programs that validated their risk tools on a similar population were coded as 1.

<sup>52</sup> Assessment categories represent the cumulative effects of meeting multiple items.

### CPC: Program Level Measures: Quality Assurance Items

Measures	Category
Group Observation <sup>53</sup>	Less than 3X per year
	3 or more times per year
Staff Evaluation Scale <sup>54</sup>	0 to 1
	2 or more
Internal CCIS Audits <sup>55</sup>	No
	Yes
External Quality Assurance <sup>56</sup>	No
	Yes
Evaluation Categories <sup>57</sup>	0 to 1
	2
	3
Full Categories <sup>58</sup>	Low
	Moderate
	High

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<sup>53</sup> Programs that observed group three or more times per year were coded as 1.

<sup>54</sup> Staff Evaluation Scale measured factors staff are evaluated on, typically in an annual performance evaluation.

<sup>55</sup> Programs that conduct structured internal CCIS audits were coded as 1.

<sup>56</sup> Programs that relied upon external agencies to provide services to residents, and had quality assurance practices aimed at monitoring the quality of such services (i.e., reviewing progress notes and periodically observing the intervention) were coded as 1.

<sup>57</sup> Quality Assurance categories represent the cumulative effects of meeting multiple items within the Quality Assurance domain.

<sup>58</sup> 0-13=low; 13-20=moderate; 21+=high.



### CPC: Program Level Measures: Treatment Items

Measures	Category
Treatment Targets <sup>59</sup>	1 to 2
	3 to 4
Cognitive Behavioral Group Scale <sup>60</sup>	-1
	0
	1
Domestic Violence Group Scale <sup>61</sup>	-1
	0
	1
Gender Specific Group Scale <sup>62</sup>	0
	1
	2
Dual Diagnosis Group <sup>63</sup>	No
	Yes
Punishment Process <sup>64</sup>	Follows 1 Guideline
	Follows 2 to 4 Guideline
Appropriate Types of Punishers <sup>65</sup>	No
	Yes
Use of Graduated Practice <sup>66</sup>	No
	Yes
Group Size <sup>67</sup>	Ratio greater than 10/1
	No More than 10/1
Treatment Categories	0 to 2
	3 to 4
	5 or more

<sup>59</sup> Programs received a point for targeting each of the following characteristics: criminal attitudes, interpersonal relationship skills, relationships with significant others, vocational skills, self-control, and criminal personality.

<sup>60</sup> A point was deducted if a cognitive behavioral (CB) group was offered but it had no positive attributes; no point was awarded if there was not a CB group offered; or 1 point was awarded if a CB group was offered 4 or more hours per week or the group allocated at least 50 percent of the time to role playing activities.

<sup>61</sup> A point was deducted for programs that offer domestic violence group with none of the positive attributes mentioned for this item; 0 points were awarded if no domestic violence group was offered; 1 point was awarded when this group was offered with one or two positive attributes; and 2 points were awarded when this group was offered with all three positive attributes.

<sup>62</sup> 0 points awarded if no gender-specific group was offered; 1 point for programs offering a gender-specific group; 2 points were awarded if a gender specific intervention was offered with at least one positive attribute.

<sup>63</sup> Program that offered dual-diagnosis groups were coded as 1.

<sup>64</sup> Effective guidelines identified by the data include: punishment is based on exhibiting an antisocial behavior; an explanation is provided for the punishment; punishments are individualized.

<sup>65</sup> Examples of inappropriate punishment types include use of shaming techniques or using treatment or treatment activities as the punishment. Programs that used appropriate types of punishers were coded as 1.

<sup>66</sup> Program that offered regular graduated practice of skills in increasingly difficult situations were coded as 1.

<sup>67</sup> Programs that consistently offered treatment groups of an appropriate size were coded as 1.